Review of: "Design and analysis of hand-break release system with the help of accelerator of automobile vehicle"

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The article titled "Design and analysis of hand-break release system with the help of accelerator of automobile vehicle" by Karan Choudhary et al. presents a novel approach to improving the safety and functionality of handbrakes in automobiles. The authors propose a design that automates the release of the handbrake, addressing the common issue of accidental engagement that can lead to overheating and potential accidents.

This article contributes to the field of automotive engineering by proposing a solution that enhances vehicle safety through innovative design and analysis techniques. By addressing these weak points with the proposed solutions, the article can enhance its credibility, practicality, and contribution to the field of automotive safety.

1. Introduction

The handbrake is essential for securing vehicles when parked, particularly on slopes. The traditional manual operation poses risks of human error, which this study aims to mitigate.

Weak Points:

- Lack of detailed statistics on accidents caused by handbrake failure.
- Limited discussion on existing solutions and their shortcomings.

Solutions:

- Include data on the frequency and consequences of handbrake-related accidents to emphasize the need for improvement.
- Provide a comparative analysis of existing systems to highlight their limitations and justify the proposed design.

2. Feasibility Study

The authors suggest a handbrake release system that operates automatically based on the vehicle's ignition state, thereby reducing reliance on manual operation. This system is designed to enhance safety by ensuring proper engagement and disengagement of the brake. The paper includes detailed calculations of forces, torque, and motor

requirements necessary for the system's operation. It emphasizes the mechanical advantages achieved through the design, which allows for reduced force requirements at various points in the system.

Weak Points:

- The force calculations may not account for varying conditions such as temperature or wear on brake components.
- The calculations rely on standard efficiency values, which may not reflect real-world performance.

Solutions:

- Incorporate a range of force calculations under different conditions (e.g., temperature variations, component wear) to provide a more comprehensive analysis.
- Conduct experimental validation of the efficiency values used in calculations to ensure they are representative of actual performance.

3. CAD Model of Modified Hand Brake System

The study outlines various components involved in the system, including the frame, gearbox, motor, and accelerator mechanism, along with their specifications and functions.

Weak Points:

- The CAD model may lack detailed annotations that explain the function of each component.
- Potential absence of testing data or simulations to validate the design.
- The fabrication process may not address potential challenges in assembly or material compatibility.
- Limited discussion on the durability and long-term performance of the materials used.

Solutions:

- Enhance the CAD model with clear annotations and descriptions for each component to improve understanding.
- Include simulation results or prototype testing data to demonstrate the effectiveness and reliability of the design.
- Provide a detailed fabrication plan that includes potential challenges and solutions for assembly and material selection.
- Conduct long-term testing to evaluate the durability of materials and components under typical operating conditions.

4. Conclusion

The authors conclude that their design not only improves safety but also offers a more reliable and efficient alternative to traditional handbrake systems.

Weak Points:

- The conclusion may be overly optimistic without addressing potential limitations or areas for future research.

- Lack of specific recommendations for implementation in real-world scenarios.

Solutions:

- Acknowledge the limitations of the proposed system and suggest areas for further research or improvement.
- Provide actionable recommendations for manufacturers or automotive engineers on how to implement the system effectively in vehicles.