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A Review on Automatic Brake Failure Detection System using Buzzer

Yash Jadhav[1], Prof. J. V. Bute[2]
[1](Student (Mechanical Engineering)/Pimpri Chinchwad College of Engineering & Research, Ravet, Pune, India)
[2] (Asst. Prof. Pimpri Chinchwad College of Engineering & Research, Ravet, Pune, India)

Abstract: ***The main cause of death now a days' are the accidents. After every 5 minutes there is the possibility of accidents. There are various reasons for the accidents such as crashing of two cars, overtaking, high speed, uncontrollability of a vehicle. But the main reason for the accident is the failure of the brake system. As many of the times the driver is not aware about the failure of system and fails to stop the car which causes the crash of a car. A brake is mechanical device that inhibits movement by slowing down the body speed or slowing down. Brakes retards motion of a body creating friction between two surfaces and converts kinetic energy of the moving body into the heat. The reason for the failure of brake are many. Therefore, focusing on the problem our aim is to design a system which will provide a alert before the crashing. This system will help to know about the failure in braking system of the vehicle and will help to reduce the number of accidents. As the failure is detected by the buzzer, buzzer will notify the driver about the failure in system. With the help of buzzer the driver will get to know about the failure in system. This will help to know the driver about the failure of the system. As this system is used for monitoring continuously therefore it will definitely save the life of people and reduce the number of accidents. The aim of this work is to design a braking system with the buzzer which will give the audio signals to the driver.***

Keywords: ***Accidents, Brake, Safety, Vehicles, Automobile, Failure, Buzzer.***

I. INTRODUCTION

Now a days the Human life is more precious than anything. So we have to save human life at least the things which are under control of humans. Mostly Human life losts due to the accidents which are occurred in the world. The main reasons for accidents due to over speeding, overtaking, driving from the wrong side, do not give the right indications while changing the directions, distraction in the driving, brake failures, tyre blow out, carelessness of the driver, unknowingly , drink and drive etc. There are many reasons for accidents, but most of them are due to failure of the braking system. The reason for the brake failure is due to poor maintenance, product defects, failure to repair the vehicle in time, and many other reasons. But human safety also plays an important role, so the monitoring of braking accidents is very important in automobiles. Special safety functions are only built into the vehicle occupants, and some functions are to ensure the safety of others. Today, machines are widely controlled by control systems. The main theme of our project is to monitor the braking system all the time. Today, accidents occur due to various reasons. One of the main reasons is brake failure, which is caused by poor maintenance and product defects. In order to protect valuable personnel from accidents, accident monitoring of brakes is very important in automobiles. Just like in our daily lives, things are becoming automated and modified, but we still have to face many problems. In this accident, we are faced with major problems. It leads to thousands of lives. Many people have lost their relatives and families. In other countries, they have solutions to prevent accidents, but in our country, we still do not have solutions or preventive measures. Brake failure may cause an accident. In this case, my project brake failure indicator plays an important role in controlling the accident. The buzzer will detect the break failure in the breaking system of the vehicle which results the buzzer will beep loudly on the dashboard of the vehicle. When the system is out of danger means when the system is working properly or normally then the buzzer will not beep. If the system gets fail by any means such as the linkage in brake lining or due to poor maintenance of the vehicle therefore, the buzzer will be start to beep which indicates or give the signal to the driver the braking system of the vehicle is failed. This will help the driver to know about the failure in system. Even if the main system does not work, and most vehicles have two braking systems, most vehicles still maintain a certain degree of control over the brakes. One acts as a backup system. Although brake failure is rare in the event of a tire blowout, brake failure is actually one of the main causes of truck and large vehicle accidents. The most common cause is a leak in the brake line, master cylinder or wheel cylinder. All of these will cause break failure. In past there was no any brake failure detection system only the brakes and hand brakes were present. Currently, we can use the braking failure detection system with a various mechanical components as well as electronic components like buzzer, LED lights, which is use a indication in breaking system. In Future we can use Arduino control programming with the help of sensors as well as other electronic components.

II. LITERATURE REVIEW

In this paper the author has proposed a indication for a brake failure system and also the author has designed a system which uses buzzer, Relay, battery, switch, motor, etc like components. This system has many advantages and also it is reliable. The proposed work is very useful with calculations, block-diagrams are well defined. The calculations for Breaking torque, pedal force, Braking torque are done which will help to know about the calculations of various parameters. The list of components are defined for this project. This system can be used in two wheeler, four wheeler, Mechanical crane, Mechanical Machines. Therefore, this system also indicates about the failure in the brake system. So, the life of people can also be saved[1]. In this Research paper, the Author have used the IR sensor for the detection of failure in breaking system. It consists of IR sensor, control unit and frame. The sensor used here is used to detect the brake wire and control the signal through the alarm system. If there is failure in the break the alarm will alert the driver. As, the Auxiliary brake is fixed in wheel which helps to apply the brake and stop the vehicle. Here, for the monitoring pressure transducer sensor is used. Whenever the disc fails, this sensor is used to detect the pressure and give the warning to the driver. Therefore, this system has also proposed a model that helped with proper information[2]. In this Paper the Author has proposed the work that when the driver knows about the failure in break or collide of a vehicle, then the driver gets panic as he fails to apply the break properly. Hence the vehicle collides. The sensors and microcontrollers are linked together to know the status about the system. The sensor indicates the failure in the system Therefore, such problem causes the accident. So the author has used ultrasonic sensor, microcontroller and many more sensors to detect the accident and help to reduce the accidents[3]. In this paper the author have not designed the system practically but theoretically explained the concepts about the system. The author has described about the definition of brake also its types, working and controlling the system. This study helped to know about the theoretical knowledge. Also the author have classified the brakes according to various parameters. Materials that can be used to control the speed. The proper selection of materials is also important. Therefore, materials are also described very well. Also the factors that affects the materials. This paper has helped a lot to know about the theoretical knowledge[4].

III. WORKING PROCESS

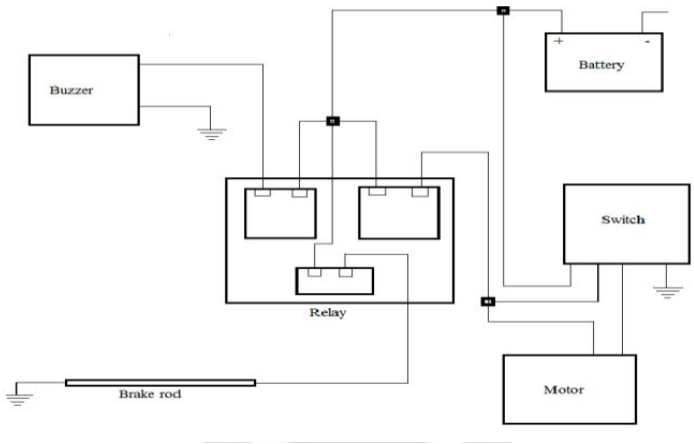

Fig.1. Block diagram of system

The block diagram above show the system representation of the automatic brake failure indicator and the brake system. The system includes battery, drum brake, buzzer, motor, relay and connection system. When the car is in motion and, unfortunately, the brakes fail at that time, the chance of an accident increases. In order to reduce this kind of accident, we have conducted research on this and carried out a project. In addition to supplying power to the buzzer, the buzzer will also be activated and instruct the driver in sound. After that, the motor rotates and the brake wire is used to apply additional braking. Therefore, the brake will apply and the vehicle will stop after a few seconds. Then, we press the switch to release the brake, the motor rotates counter clockwise, and the brake wire is wound on the motor shaft. In this case, the voltage is passed through the entire circuit, and then we brake the circuit by disconnecting the wires, which means that the brake lever of the brake system is braked. We replaced the wire or thought it was the brake lever that was about to break. One of the relays is connected to the battery, and the second is connected to the motor. When the brake fails, the switch circuit and the relay connected to the motor circuit and power supply are provided to the motor. The components used in block diagram are as follows:-

1) *Drum Brake:* The brake plays a major role in stopping the vehicle. It is the opposite of a clutch. The brake is used to rotate the axle to stop the vehicle. In two-wheelers, there are two types of brakes: drum brakes.
2) *Buzzer:* A buzzer is a device which can be mechanical, electromechanical or piezoelectric audio signal device. They are used in alarms, timers etc.
3) *Relay:* A relay is an electrically operated switch. Used as an electromagnetic relay for mechanically operating switches. If you need to control the circuit through a separate low-power signal, or you must control multiple circuits with only one signal, use a relay.
4) *DC Motor:* This is a 10RPM 12V DC gear motor for this application. It is easy to use and has a standard size. There are used nuts and threads on the shaft for easy connection, while the internally threaded shaft can be connected to the wheel.
5) *Battery:* Battery is an electro chemical cell which transfer chemical energy into electrical energy.

IV. FUTURE SCOPE

A. The use of Brake Failure Detection will result in safety of vehicles as well as to avoid Human loss.
B. The durability and convenience to consumer can be improved by using more advanced systems like Arduino control or Auxiliary Brakes.
C. Size of project can be reduced by replacing mechanical components with various mechatronics components.

V. CONCLUSION

The project setting can reduce the chance of accidents and prevent casualties. It improves the efficiency of the vehicle, thereby reducing the chance of mechanical system failure. The brake failure indication provides additional capabilities for the driver and ensures damage to life and property. The brake failure indication system is an early warning system. This system can prove to be an advancement in the machinery and automotive industries. The system continuously monitors the condition of the brake cable and alerts the rider before the brake cable is cut. Instructions to the rider are given in the type of audiovisual sign. All components are strictly placed in the unit, thus contributing to the most efficient work of the unit. Therefore, the project has been successfully designed and tested. If the indicator system is implemented in any motor vehicle to prevent accidents, the indicator system will become a new era of vehicle protection systems. There are many devices that can make the vehicle stop under abnormal conditions. But the proposed model can indicate brake failure by mechanical means before any accidents occur, and it can also ensure the safety of people and vehicles.

VI. ACKNOWLEDGMENT

The referred paper were very informative and helped to know and study about various systems and methodology. As each paper has their own content and work designed and proposed therefore, we have know that brake monitoring is very important in automobile . Also we have gathered the information for further process. These papers have helped to know and help to design our system. As some of systems were designed for only two wheeler while some of them were having some components and features missing. So we can overcome this errors by completing the system successfully.

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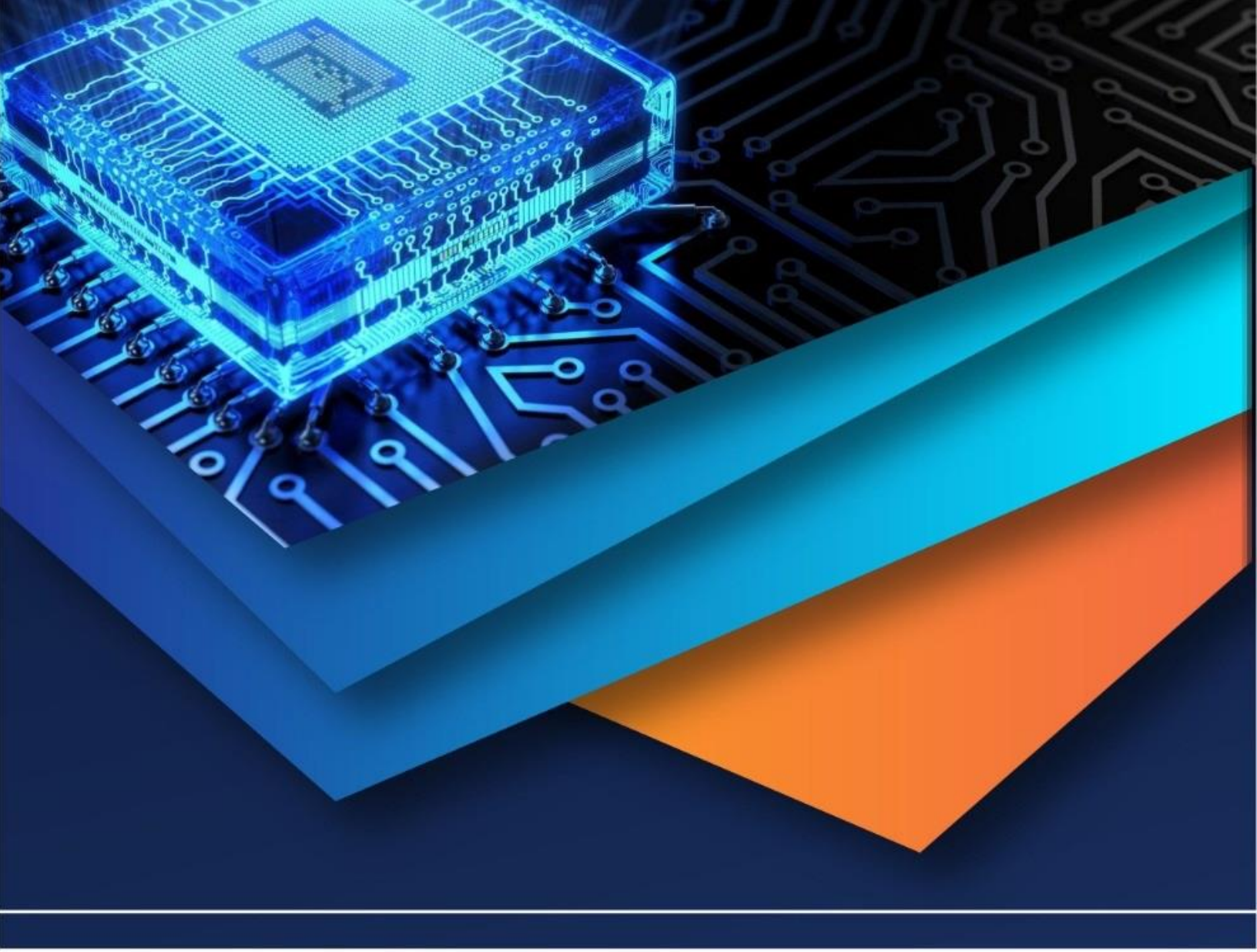

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