

AUTOMATIC BRAKE FAILURE INDICATOR AND BRAKING SYSTEM

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ABSTRACT

Automatic brake failure indicator and braking system, it is genuine project which is fully equipped and designed for automobile vehicles. This forms an integral part of good quality. The one of the main reason is brake failure, it caused to due to very poor maintenance as well as product defect, in order to safe guard the valuable human for accident the accident monitoring of brake is very important thing in automobile Vehicle safety is the avoidance of automobile accidents or the minimization of harmful effects of accidents, in particular as concern to human life and health. Special safety features have been built into vehicles occupants only, and some for the safety of others. Automatic brake failure indicator and braking system is the most effective solution on this problem .it is the most effective and the simplest methodology used to reduce the rate of accident due to brake failure. In this system the components used are two way relay, buzzer, battery, motor, wiring system. And finally the breaking system installed in the two wheeler by using these components the most effective system is to be generate. In this system, if brake failure is occur then the buzzer give the indication to the driver in the form of sound and simultaneously alternative braking system start their working and apply the secondary brakes by using motor fitted to the chassis, as the result of these the speed of the vehicle get reduced and vehicle is stop in some second. The main advantage of the system is that it is compact in size, and the installation cost is very less. If this system is install in vehicle then accident due to brake failure get reduced, as the result of these the rate of accident due to brake failure get reduce.

Keyword: - Brake, Relay, motor, and Vehicle.

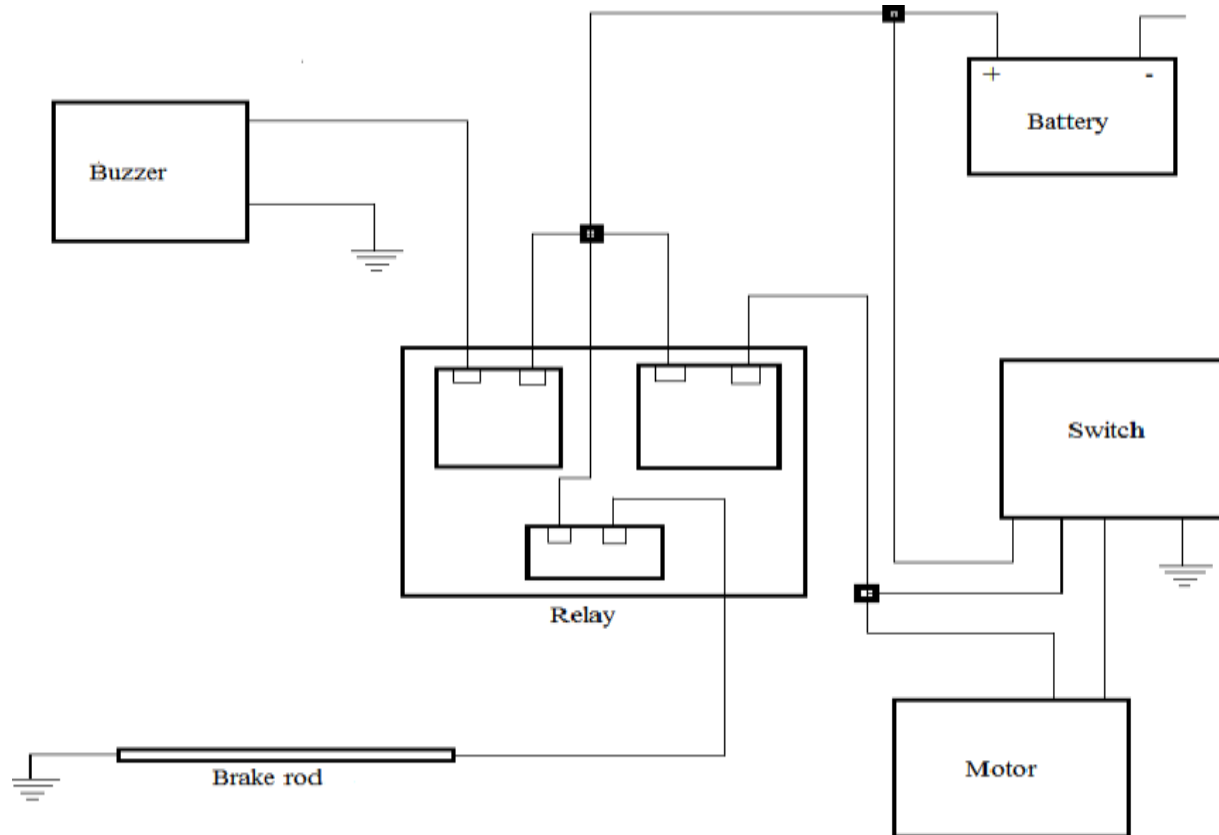
1. INTRODUCTION

Today accidents are occur due to many reasons, the one of the main reason is brake failure, it caused to due to poor maintenance as well as product defect, in order to safe guard the valuable human for accident the accident monitoring of brake is very important thing in automobile Vehicle safety is the avoidance of automobile accidents or the minimization of harmful effects of accidents, in particular as concern to human life and health. Special safety features have been built into vehicles occupants only, and some for the safety of others. We have pleasure in

introducing our new concept “Automatic Brake Failure Indicator and braking system”. This is equipped by relay braking unit. It is genuine concept which is fully equipped and designed for automobile vehicles. This forms an essential part of best quality. This product underwent test in our automobile vehicles and it is best. A brake is a mechanical device that inhibits motion by slowing down a body or by slowing it. Brakes retard the motion of a body creating friction between two working surfaces and converts the kinetic energy of the moving body in to heat. Brakes are generally applied to moving as well as tyres. Sometimes brake failure may occur when the brake lining is cut-off.

2. DESIGN AND WORKING PROCEDURE

2.1 DESIGN



Block Diagram of System

2.2 WORKING PROCEDURE

- Above block diagram and circuit diagram shows the systematic representation of automatic brake failure indicator and braking system.
- The system contain the battery, drum brake, buzzer, motor, electrical relay and the connecting system.
- When the automobile vehicle is in motion and the unfortunately brakes are fail at that time the chances of accident were increase.
- To reduce that kind of accident we doing the research and doing the project on this, for reducing accident.
- For doing the experiment or for checking the ability of project, first we take a one vehicle and install the system on the vehicle.
- When the vehicle is in motion without brake failure, at this condition the system is not in working.
- Here we are transfer the signal voltage through the Brake Wire from one end to other end.
- At the other end in the wheel the signal conditioning unit identify that whether the signal voltage in the Brake wire is available or not.

- At this condition the voltage is pass throughout the circuit, then we brake the circuit by disconnecting the wire, means the brake rod of braking system get brake .we replace or consider the wire as a brake rod which is to be broken.
- The one connection of the relay is given to the battery and the second to the motor.
- As the brake fail, the relay which switch the circuit and connect to the motor circuit and power supply is given to the motor.
- As well as the power is also supply to the buzzer, buzzer starts and give the indication the driver in the form of sound.
- After this the motor rotates and apply the additional brake by using brake wire.
- Due to this the brake apply and vehicle stops after the some second.
- Then we press the switch for releasing the brake, the motor rotates anticlockwise and the brake wire get wound on the motor shaft.

3. CALCULATION

- Braking force (Fb) =Fn*μ

$$F_n = \text{mass} * \text{gravity}$$

$$= 144 * 9.81$$

$$= 1412.64 \text{ N}$$

$$\mu = 0.8 \text{ consider max (road)}$$

$$F_b = 0.8 * 1412.64$$

$$F_b = 1130.112 \text{ N}$$

- Pedal Force = 25Kg =245.25 N

- Braking torque (Tb) = Fb*R

$$T_b = 1130.112 * 0.22$$

$$T_b = 248.62 \text{ Nm}$$

Where,

F_n = Force Applied On Pedal in N

μ = Coefficient Of Friction

R = Radius of Wheel in M

F_b = Braking Force in N

T_b = Braking Torque in Nm

4. COMPONENTS OF PROJECT

In this system the components used are two way relay, buzzer, battery, motor, wiring system, and finally the breaking system installed already in the two wheeler.by using these components the most effective system is to be generate.

4.1 Drum Brake A brake plays a main role in stopping the vehicle. It is opposite of Clutch. A brake is used to rotating axle to stop the vehicle. In a two wheeler two types of brakes: Drum brake & Disc Brake.

Generally drum brakes are widely used in the rear wheel. In India and many nations we find the application of drum brake on both front and rear wheel. A drum brake used brake shoes or friction pads to create braking force.

A drum brake assembly having brake shoes or friction pads, brake pedal or lever, springs, brake cable, brake drum, brake arm, brake cam, Dust seal, Anchor pin washer, brake panel.

4.2 Buzzer

A buzzer or beeper is an audio signaling device which is mechanical, electromechanical, or piezoelectric. Buzzers and beepers used in alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

4.3 Relay

A relay is a switch which operated electrically. Relays used as an electromagnet to mechanically operate a switch. Relays are used if it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal only.

4.4 DC Motor

It is 10RPM 12V DC geared motors for this applications. It is easy to use and available in standard size. There are used nuts and threads on shaft to easily connect and internal threaded shaft to connect it to wheel.

4.5 Battery

Battery is an electro chemical cell which transfer chemical energy into electrical energy.

5. ADVANTAGES

1. No need of external battery. Circuit can be powered from the vehicle's battery itself.
2. Power consumption is comparably less.
3. It is not depend on the petrol level.
4. Operating principle is very easy.
5. Installation is simplified very much.
6. The safety of driver is ensured.
7. Brake failure is notified to the surrounding traffic via buzzer.
8. The cost is low.

6. APPLICATION

1. Four wheeler application
2. Two wheeler application
3. Mechanical Crane
4. Mechanical machines

7. CONCLUSION

This setup reduces the accidents and prevents loss of life. Auxiliary braking gives additional capability to the driver and to ensure prevention of damage to life and property. The project give more confidence that we will be able to apply in practice, whatever theoretical knowledge. If really persuade us to do more and more, perhaps in good way in our future. Brake failure indicator is an early warning system. It constantly monitors the condition of the brake and give audio visual signal. This setup reduces the accidents and prevents loss of life. Auxiliary braking gives additional capability to the driver and to ensure prevention of damage to life and property

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