

Design and Fabrication of Automatic Brake Failure

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Abstract – Now a days accidents may occur due to various reasons, the foremost reason is brake failure and is caused due to poor maintenance as well as product defect. In order to safe guard the valuable human life from these accidents; there is a need for monitoring of braking system in automobiles. Automobiles have been the primary mode of transportation for most of us and we depend on them for our day to day commute. Brake failure indicator circuit is a circuit that constantly monitors the condition of brake. The sensor which is attached to the circuit of a brake failure by monitoring the brake switches and reminds you the condition of brake every time when brake is applied. This mechanism involves a Brake wire which runs from the brake lever to the braking mechanism set-up of the vehicle. It is this wire that gets pulled when we apply brakes to stop our vehicle. The sensor is used to detect the break wire, the control signal to the alarm unit. Similarly the auxiliary brake is fixed to the wheel frame and this can apply the brake and stop the vehicle.

Key Words: brake, sensor, automobile, transportations.

1. Introduction

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 convert the kinetic energy of the moving body into heat. Sometimes brake failure may occur when the brake lining is cut-off. Most brakes commonly use friction between two surfaces pressed together to convert the kinetic energy of the moving object into heat, though other methods of energy conversion may be employed. For example, regenerative braking converts much of the energy to electrical energy, which may be stored for later use. Other methods convert kinetic energy into potential energy in such stored forms as pressurized air or pressurized oil. Eddy current brakes use magnetic fields to convert kinetic energy into electric current in the brake disc, fin, or rail, which is converted into heat. Still other braking methods even transform

kinetic energy into different forms, for example by transferring the energy to a rotating flywheel. Brakes are generally applied to rotating axles or wheels, but also take other forms such as the surface of a moving fluid (flaps deployed into water or air). Some vehicles use a combination of braking mechanisms, such as drag racing cars with both wheel brakes and a parachute, or airplanes with both wheel brakes and drag flaps raised into the air during landing. The aim of this work is to design a braking system with indicator. Brake failure occurs only because of worn out of brake shoe and cut in liner. This system provides audio and visual alert when the brake fails.

2. Problem Identification

Our problem is that we don't have brake failure indication system in automobile, so to overcome the brake failure we have to do.

1. To design an Automobile Brake Failure Indicator with Auxiliary Braking System for a drum brake system and test it. a) To modify mechanism of Car system to make it more safe. b) To make effective braking system.
2. Increase safety at while driving vehicles.
3. Conceptual design for future electric vehicles

3. Objective

The main objective of this project is to avoid accidents due to brake failure. The specific objectives of this project were:

1. To design an Automobile Brake Failure Indicator with auxiliary disc brake for a drum brake system. a) To create a 3D model for the same. b) To observe the working of the system.
2. For the protection of lively hood.
3. To connect the audio visual indicator with a limit switch to the lever of tyre drum

4. Design Modeling

This model is usually used to describe an object oriented programming approach. ... Collaboration: Using this

element, you would describe the interaction between various elements.

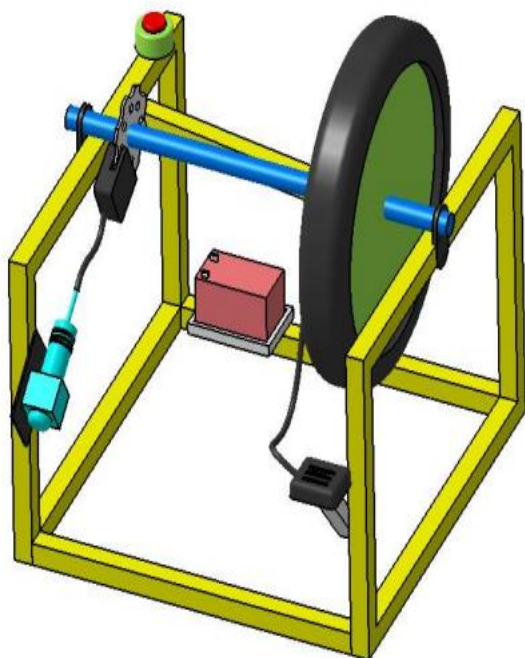


Fig. -1. Design Model

The 3-D modeling of machine and the components is carried out in CATIA software. The modeling application also provides “features based” solid bodies by directing editing capabilities, hitch allow changing ad updating solid bodies by directing editing the dimensions of a solid feature.

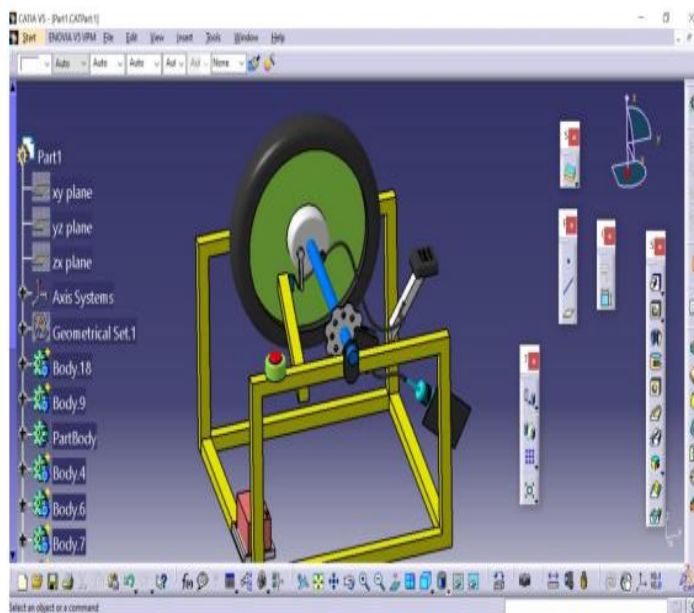


Fig. -2. Design Model

5. Working

Working of this prototype is as simple when a vehicle is moving the brake is pressed by pedal vehicle will stop with the help of drum brakes. Now, Case I: when the brake drum fails or the cable or the link join get broken then the lever of drum brake goes to Rear side and it pushes the limit switch as shown in image highlighted in red



Fig. -3. Actual Model

Case II : As the topic names clears Automatic Brake Failure Indicator With Auxiliary Braking System ,in this system when the limit switch get pressed in brake fail condition, limit switch activates the solenoid gun (by connecting the solenoid gun to the battery terminal ,here limit switch acts as sensor come switch)which is connected to the disc brake.

Case III: And hence once the disc is locked, the tyre shaft also gets locked & the emergency brake get applied to the system. There is no more complicated sensors involved in system.

5.1 Brake Failure Working

The car starts and the car stops. As drivers, we need both of these features as much as we need to breathe in and out. If you've ever been in a vehicle that did not stop, you know the sheer terror that brake failure can cause. Whether your vehicle is equipped with disc or drum brakes, you expect them to work when you hit the brake pedal.

Brakes can't talk -- or can they? If you're not distracted with chatter or music, you might hear your brakes trying to tell you when something's wrong. Brakes have their own language; they squeal, click, squeak and grind.

The easiest way you can avoid brake failure is by maintaining the vehicle regularly and being attentive to any changes in performance. Because a vehicle's brake system involves many components along the entire length of the vehicle, any number of things can go wrong. Calipers, drums and brake pads, oh my!

Let's say that despite your attentive care of the vehicle, the brakes begin to fail. What dangers might you and your passengers face, and how can you prepare for them? What will you do if you are towing a boat or trailer and experience brake failure? How can a runaway truck ramp help if your brakes stop working? In this article, we'll investigate the answers to these questions, explaining everything you need to know along the way.

6. Results

1. It prevent small number of accident occurs in trains and boats by the failure of brake switch.
2. It gives the audio visual indication when there is a mistake in braking system.
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7. Conclusion

The main purpose of this project is to provide such a device to vehicles operator so that any harmful damage and accidents cause by failure of brake switch can be easily prevented by the proper indication of working condition of brake switch. There are many aims of this project describe as:-

1. It indicate the proper working condition of brake switch
2. It prevents small number of accident occurs in trains and boats by the failure of brake switch
3. It gives the audio visual indication when there is a mistake in braking system.

8. Future Scope

1. It can be used with high sensitivity pressure sensor.
2. If in case the brake fails, brake failure indicator can also be used in order to shut down the vehicle's engine

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