Scientific Journal of Impact Factor (SJIF): 4.72

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 4, Issue 12, December -2017

Review Paper on Automatic Braking System with Pneumatic Bumper

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Abstract — *Now a day's vehicle accidents is the major problem. This breaking system used an innovative Technique for the purpose of preventing accidents happens in the restricted roadways. The purpose of this system is based an intelligent electronically control with automatic bumper activation system is known as "Automatic braking with pneumatic bumper system". This system is assembled on four wheeler vehicle. Generally this system consist of two mechanisms and these are automatic braking system and pneumatic bumper system. Automatic braking system uses the infrared sensor (IR) which senses the vehicle which come in front of our system and which may be cause for accident. Then sensor gives feedback to engine through relay to stop the working of engine. During the working of Automatic braking system simultaneously the driver of vehicle also try to stop the vehicle by pressing brake pedal. Limit switch is provided below the brake pedal which used to activate the pneumatic bumper and disc brake simultaneously to reduce the damage our vehicle which occurs if both vehicles collapse on each other. This provide pre-crash safety for vehicle. As well as this system improve the response time of vehicle braking to keep safe distance between two vehicles. By using this system we control the speed of vehicle in small distance.*

Keywords- *Automatic Braking System; Pneumatic Bumper ; IR Sensor; Safety; Accident.*

I. INTRODUCTION

Today India is the most important under developed country in the world. India is the largest country in the use of various type of vehicles. As the available resources to run these vehicles like quality of roads, and unavailability of new technologies in vehicles are cause for accidents. The number of peoples which are dead during the vehicle accidents is also very large as compared to the other causes of death. Though there are different causes for these accidents but proper technology of braking system and technology to reduce the damage during accident are mainly affect on the accident rates. So today implementation of proper braking system to prevent the accidents and pneumatic bumper system to reduce the damage is must for vehicles.

II. RELEVENT TERMS

IR SENSOR - A Infrared Sensor is a transducer used to make a measurement of a physical variable, As shown in Figure 1.

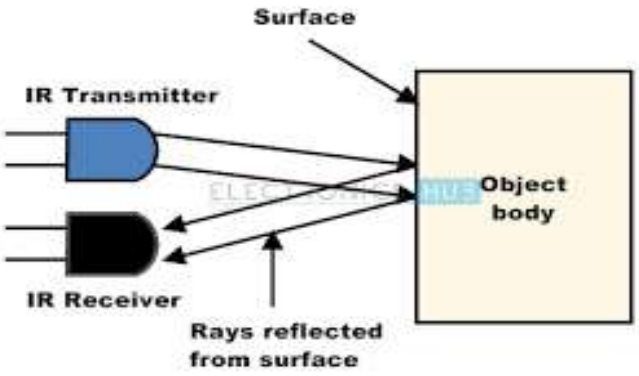

Figure 1. Infrared Sensor

IR TRANSMITTER AND IR RECEIVER - The IR transmitting circuit is used in many projects. The IR transmitter sends 40 kHz (frequency can be adjusted) carrier under 555 timer control. IR carriers at around 40 kHz carrier frequencies are widely used in TV remote controlling and ICs for receiving these signals are quite easily available. The transmitted signal reflected by the obstacle and the IR receiver circuit receives the signal and giving control signal to the control unit. The control unit activates the pneumatic breaking system, so that break was applied.

CAD MODEL OF THE SYSTEM - The cad model of the prototype was created using AUTOCAD software. The cad model is used only for visualization of the system design, and hence, dimensions are not the same as used in the actual prototype. The screenshot of created cad model is shown in Figure 2.

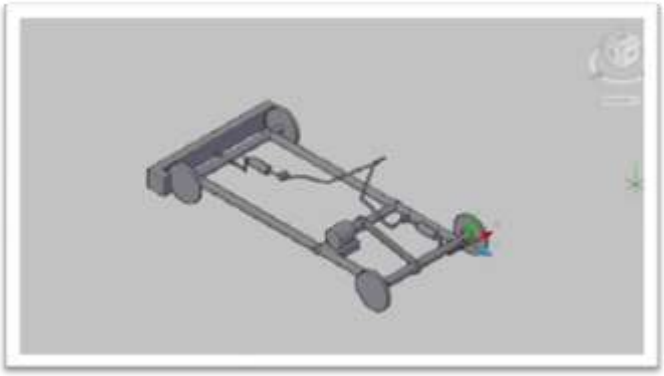

Figure 2. CAD Model of the System (Automatic Braking System with Pneumatic Bumper)

LIST OF COMPONENT USED FOR THE SYSTEM:

1. Single acting pneumatic cylinder
2. Flow control valve
3. Wheel
4. Solenoid valve
5. Single phase induction motor
6. Sensor unit
7. Pulley
8. Stand
9. Frame
10. Sensors
11. Brake
12. Iron rods,etc.

III. ADVANTAGES AND LIMITATIONS OF THE SYSTEM

Advantages of the System:

- It able to Increase the sureness in braking system.
- Braking system able to give fast response.
- System able to increase the pre-crash safety.
- System able to provide more safety to the passengers.
- System plays an important role to save human life in road accidents.
- The design also increases the crashing distance by providing extra space due to extension of the bumper, decreasing the chances of injuries to commuters.

Limitations of the System:

- System have few limitations in densely traffic road.

- System have no provision to prevent and cure the accidents from rear side of vehicle.
- IR sensor range is small.
- Proximity sensors may sense obstacle due to presence of dirt
- Sensors may stop working due to random reasons

III. APPLICATIONS OF THE SYSTEM

- This system may be applicable in all types of light vehicles like cars, Rickshaws, Tempos.
- This system also successfully installed in the heavy vehicles like buses, trucks, trailers, etc.

IV. CONCLUSION

Automatic brake with pneumatic bumper system is an additional safety to heavy vehicles with passenger car . It is easy to make such a system in heavy air brake vehicles. An emergency switch is provided for emergency uses . This switch avoids the driver to stand from his seat .

The system carried out by us made an impressing task in the field of automobile manufacturing industries. It is very useful for the workers work in the lath and small scale industries.

This system will reduce the cost involved in the concern. system can be design to perform the entire requirement task at the shortest time available.

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