

AUTOMATIC PNEUMATIC BUMPER

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ABSTRACT -In this system controlling is done by IR sensor with the help of IR sensor pneumatic bumper actuate brake will applied. When the obstacle come in front of sensor the IR sensor sense and it will be actuate the solenoid valve which having a two output and one input. Input is connected from compressor and the output is connected to the pneumatic cylinder by which the bumper will go further and comes back by the compressed gas. When the obstacle comes in front of car the IR sensor unit will command to the control unit and control unit will cut the power off motor by this rotation of wheel decreases and brake will applied. In our project we overcome the accident problem by means of providing the sensor arrangement in bumper. The aim is to design and develop a control system based an intelligent electronically controlled automotive bumper activation system is called automatic pneumatic bumper. This system is consist of IR transmitter and receiver circuit, control unit, pneumatic bumper system. The IR sensor is used to9 detect the obstacle.

I. INTRODUCTION

We have pleasure in introducing our new project AUTOMATIC PNEUMATIC BUMPER which is fully equipped by IR sensor circuit and pneumatic bumper activation circuit. Vehicles accident is most common. The system include sensor arrangement for sensing an object in front of the vehicle that generates an object recognition single unit it sense an object within the range the bumper opens and protect the car from damage. The sensor arrangement include passive IR sensor or reflected pulse sensor such as radar sensor on the front a control generates an accident prevention response signal and receiving an object recognition signal from the sensor arrangement.

The project involves whenever the obstacle comes in front the car. The sensor senses the obstacle and command to the bumper extended out by which we can avoid damage of car.

The road accident is caused by human. The cause of road accident is rash driving, over speed, and caused of injury and death are non-wearing seat belt. There are various steps taken by the experts to reduce the probability of accident. There are three approaches to prevent accident.

1. Education and training
 - a) Traffic rules should be thought to the student.
 - b) Radio, news paper to draw the attention of all road users both to danger and to safe practices on the road.
2. Engineering of vehicle and road
 - a) There should be proper design of spare parts of cars.
 - b) The design of vehicle should be improving and making comfortable for people.
 - c) The number of things that other driver do. Which is dangerous not following lane, poor tailgating, not indicating while turning.

1.1 Problem Statement

There are various mechanism operated for braking the system like ABS, pneumatic breaking, hydraulic breaking etc. but all this mechanism which given above its totally manually operated. Whenever the obstacle come in front of vehicle the man press the brake pedal by which the car stop that is all breaking mechanism receive input from the driver so it called manual operated. But man is fail to give power input because whenever the obstacle come in front of vehicle the man is unable to stop the car. He becomes mazy and he unable to judgment therefore the breaking mechanism is unable to work properly and the car driver is unable

to decreases the car damage. Now we use the pneumatic bumper. The pneumatic bumper having a specific capacity when the force of accident is very high that time bumper is unable to protect the car damage. So this system is unable to reduce the damage of human being and cars.

1.2 Objectives

- To decreases the rate of car accident.
- To increases the response of breaking system.
- To increases the sureness of people who fear from accident.
- We are trying to protect car damage from road accident.

1.3 Scope

- This system is suitable for all types of vehicle like cars, trucks, bus, etc.
- Vehicle will stop at right time by this mechanism and prevent from accident.
- System also able to protect the car before collapse and protect the life of people.
- This system play very important role to protect from damaging the cars and also helpful for saving human life.

II. LITERATURE REVIEW

1.The aim is to design and develop a control system based on pneumatic breaking of an intelligent electronically controlled automotive braking system. Based on this model, control strategies such as an ANTILOCK BRAKING SYSTEM (abs) and improved maneuverability via individual wheel braking are to be developed

2.ABS braking systems have been well-known in the automotive industry for many years. At first, they were optional extras for upmarket vehicles, then became more “democratic” as part of the basic equipment of most vehicles. Several generations of such systems have followed one another and now they are considered perfect by the general public and so need not, or can not, be improved. Yet, a generalized conception (Richalet,1991) or a mechatronics approach (Isermann, 1996), i.e. a reflection on all the principles, components, sensors, actuators, regulation, etc., can lead to important improvements in these fields, as in others.

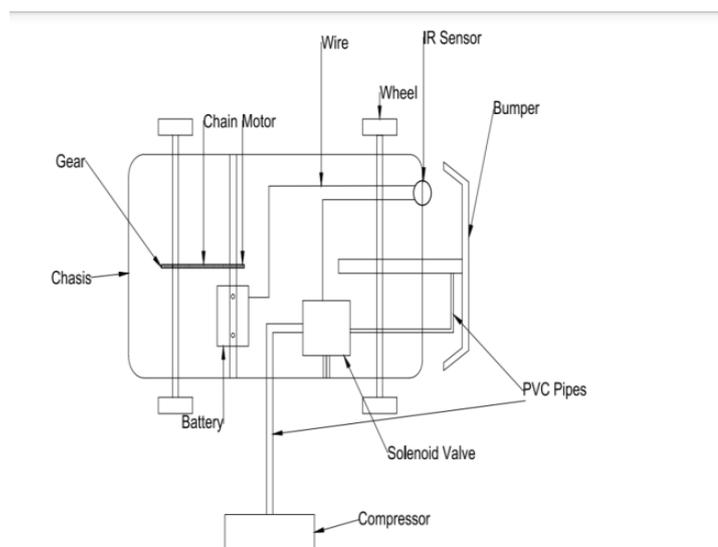


Fig 1.1 Design of system

2.1. Proximity sensor

A sensor is a transducer used to make a measurement of a physical variable. Proximity is a sensor which senses the obstacle without any physical contact. Proximity sensor emits an electromagnetic radiation. When the electromagnetic radiation impinge the target The proximity sensor sense that any obstacle comes in the range of vehicle proximity sensor having a very long life because it does not having any physical contact with object therefore there is no chance of damage. Without damage and any physical contact it sense object. Proximity sensor are mostly used in smart phones. The most popular sensor used in remote sensing are the camera , solid state scanner, such as CCD(charged couple vehicle)

2.2. Nylon small tire wheel

Tire is a ring shaped covering that fits around a wheel rim to protect it and enable better vehicle performance. A tire is made up of synthetic rubber, natural rubber, fabric with carbon black and other chemicals compounds.

Specifications:-

Wide of tire:-20mm

Diameter of tire:-70mm

Diameter of shaft hole:-6mm

2.3. Dry battery

It was introduced by German scientist Carl Gassner in 1886.

Sealed lead calcium maintenance free battery is contains the paste of electrolyte with a less moisture for passing current. It is advanced battery and economic different from other type battery.

2.4. Pneumatic cylinder

The cylinder is a single acting cylinder one, which means that the air pressure operates forward and spring returns backward. Pneumatic cylinder uses the power of compressed gas to produce the force in reciprocating linear motion. The piston rod transfer the force it develops to the object to be moved

2.5. Pneumatic valve

Pneumatic valve is connected with pneumatic cylinder and compressor. The pneumatic valve having two outputs and one input from input the compressed air is given and one output is use for stopping the piston and other output is use for giving the force to the piston rod. The compress air is given through the input . one output is use to reciprocating the piston and other is used for stopping the piston by applying force from front side.

III. Applications

- In bikes.
- In four wheels.
- For automobile application
- Industrial application

IV. Advantages

- Comfortable driving at busy roads and in narrow space.
- Free from wear adjustment
- Less power consumption
- It gives simplified very operation
- Installation is simplified very much
- This types of cars may be easily taken through traffic jam.
- This type of mechanism eliminates the accident chances.
- Reduce vehicle expenses.

V. Limitations

In our model use electronic circuit and operates on 12 volt DC battery if unfortunately any voltage fluctuates occurred in the line damage the circuit components and due to this system got failure.

VI. Conclusion

- Reduce the number of accident or damages in car.
- Additional cost is required to install this arrangement in the vehicle
- It is also used for security alert alerts where 24 hours surveillance is required.

VII. References

- Prof. Mujumdar : "Pneumatics – Study Material
- International Research Journal of Engineering and Technology (IRJET)[1998].

BIOGRAPHIES



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