

# Fabrication of Pneumatic Bumper in Four Wheeler

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**Abstract**— The India has faced many accidents in past 10 years. Accidents are the major problem in India. This project is made to reduce such a mishaps. In our project a high speed indication is given and automatic bumper is moved front of the vehicle setup with help of pneumatic system when the setup speed is exceeded. In our project, we have used solenoid valve and a control circuit. It is very important to attach in every vehicle. Mainly it is used for night drive.

**Key words:** Pneumatic Bumper, Four Wheeler

## I. INTRODUCTION

A bumper is the front or rear part, of design to allow the car to sustain an impact without damage to the vehicle's safety systems. It is not capable of reducing injury to vehicle occupants in high-speed impacts, but are increasingly being designed to mitigate injury to pedestrians struck by cars.

wide range of flow rates and pressures. The air of Compressed air was expelled by primitive man to give glowing embers sufficient oxygen to allow them to flare up into a fire. During this process, the temperature increases as the pressure increases.

The present invention relates to energy absorbing bumpers specifically, a light weight bumper presenting a soft collision interface to objects on impact, and having a relatively wide, effective angle of collision acceptance. Although various fluids may be employed in such bumpers, the utilization of air as the working fluid not only produces a lighter weight assembly, but also obviates the need for seasonal maintenance which is necessary in some climates with liquids.

## II. COMPRESSOR

Compressor is the air producing machine. The air was taken through the atmosphere during the machine is running. Air compressors are used to raise the pressure of a volume of air. Air compressor are available in so many configurations and will operate over a very wide range of flow rates and pressures.

## III. PNEUMATIC CYLINDER

An air cylinder is an operative device in which the state input energy of compressed air in pneumatic power is converted into mechanical Output power, by reducing the pressure of the air to that atmosphere.

### A. Single Acting Cylinder:

Single acting cylinder is an capable of performing an operation in only one direction. Single acting cylinders added with one inlet for the operating air pressure, can be production in several fundamentally different designs. Single cylinders Develop power in one direction only.

### B. Double acting Cylinder:

A double acting cylinder is employed in control systems with the full pneumatic cushioning and it is essential when the cylinder itself is required to retard heavy messes. This can be done only at the end positions of the piston stroke. In all intermediate position a separate externally mounted a derive most be provided with the damping feature.

## IV. SOLENOID VALVE

The directional valve is one of the important parts of a pneumatic system. Commonly known as DCV this valve is used to control the air flow direction in the pneumatic system. The directional valve done this by the position changing of its internal movable parts.

This valve was selected for speedy operation and to reduce the manual effort and also for the modification of the machine into automatic machine by means of using a solenoid valve.

## V. WORKING PRINCIPLE

The sensor senses the speed of the vehicle and the signals are sent. The According to the speed value set in the control unit the pneumatic cylinder is actuated and retracted. The signals are received by the microcontroller. These signals are used to operate the solenoid valve automatically. The control unit gets the corresponding signal from the sensor and it activates the solenoid valve to supply the air through the pneumatic cylinder, and it pushes the bumper front, the sensor gives the signal to the control unit and it deactivates the solenoid valve, by this process pneumatic cylinder will move in reverse direction.

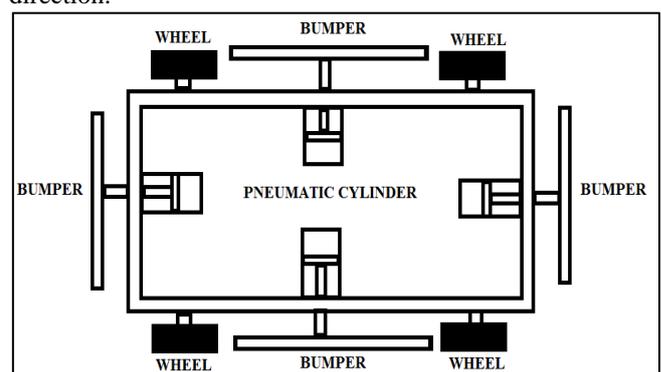
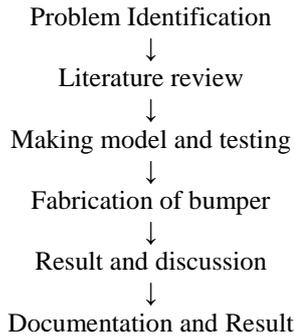


Fig. 1:

## VI. ADVANTAGES

- 1) Easy to fitting the arrangement in vehicle
- 2) Low cost
- 3) Maintenance is easy
- 4) Power can be easily transmitted

## VII. METHODOLOGY



## VIII. CONCLUSION

Behind the designing of this system, our main aim is to improve the prevention technique of accidents and also reducing the damage from accidents like damage of vehicle, injury of humans, etc. We observed that our work is necessary to achieve all the objectives.

## REFERENCES

- [1] Aayush Chawla, Abhijeet Kulkarni, Rushikesh puranik, Adarsh raj Automatic pneumatic bumper and braking system department of automobile engineering, Vel tech university international research journal of engineering and technology issue-08/08/2018
- [2] Junendrasingh, Shivamraj, Saurabh kr. Study of pneumatic bumper, Department of Mechanical Engineering, IIMT college of engineering Indian journal of research issue-07/07/2017
- [3] Katore s.r,katlag s.c,mane p.v,pawar g.v,londhe b.c Automatic Braking and pneumatic bumper,department of mechanical engineering,savitribai phule pune university international journal of engineering,issue-01/04/2015
- [4] Momin husen shanshuddin,Mistry Arbit Harendra,Taskar ganesh vishnu, pneumatic bumper with automatic braking system shanratchaadra pawar college of engineering international journal of research in advent technology issue-15/02/2017.
- [5] Swapnilpatil, Suraj mohite, Mahesh motkar,Omkar kurlekar, Krushna raut automatic pneumatic bumper in four wheeler vehicle Genpa Spooanrao College of engineering international conference on recent innovations issue-07/04/2018