

# AUTOMATION WITH ACCIDENT PREVENTION SYSTEM

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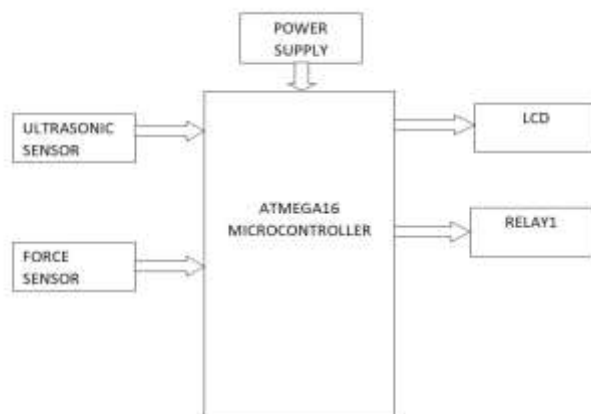
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**Abstract** The technology of electronics plays a major role in the field of automation and modern machine shops and space robots. The aim is to design and develop a control system based intelligent electronically controlled automotive bumper the control unit and bumper simultaneously. The bumper comes forward. Bumper system and overloading system is provided for protection of vehicle engine and damage of the vehicle. As our system is designed as a smart vehicle, in that we are using force sensor to avoid over load of vehicle and to avoid the accidents due to over load. As soon as weight in the vehicle becomes more, the brake will applied to the vehicle through relay2.

**Keywords** — Bumper, US sensor , US transmitter, Proximity sensor, Road safety , Vehicle Overloading ,

## I. INTRODUCTION

As the available resources to run these vehicles like quality of roads, and unavailability of new technologies in vehicles are causes 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 various causes of the accidents but proper technology of braking system and technology to reduce the damage during accident are mainly effects on the accident rates. So today implementation of proper braking system to prevent the accidents during overloading and pneumatic bumper system to reduce the damage is must for vehicles. To get this system implementation goal, we design this Smart breaking system with pneumatic bumper and overloading system . It is the project which has been fully equipped and designed for auto vehicles .



## II . components

1. Compressor
2. Frame
3. L clamp
4. Solenoid valve
5. Control Unit
6. Force sensor
7. LED
8. UR sensor
9. Double acting cylinder
10. Flow control Valve
11. Braking arrangement

## III. Working Principle

The compressed air from the compressor at the pressure of 5 to 7bar is passed through a pipe connected to the Solenoid valve with one input.

The Solenoid Valve is actuated with Control Timing Unit.

The Solenoid valve has two outputs and one input. The air entering into the input goes out through the two outputs when the timing control unit is actuated.

Due to the high air pressure at the bottom of the piston, the air pressure below the piston is more If the solenoid valve is activated, the compressed air passes to the Double Acting Pneumatic Cylinder.

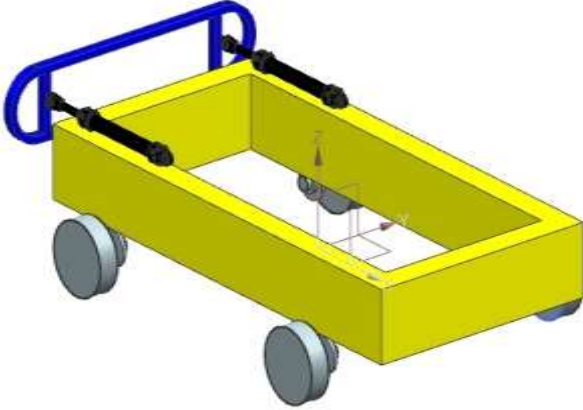
The compressed air activates the pneumatic cylinder and moves the piston rod. If the piston moves forward, then the braking arrangement activated.

The braking arrangement is used to brake the wheel

gradually or suddenly due to the piston movement.

The braking speed is varied by adjusting the valve is called “FLOW CONTROL VALVE”.

This is how we have to apply the braking arrangement to all the wheels .

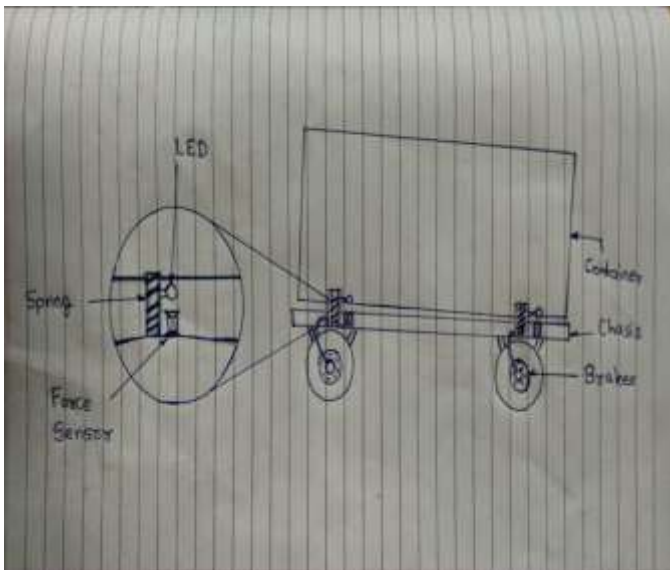


Block Diagram

As our system is designed as a smart vehicle, in that we are using force sensor to avoid over load of vehicle and to avoid the accidents due to over load. As soon as weight in the vehicle becomes more, the brake will applied to the vehicle through relay2.

When overloading of vehicle occurs force sensor measure the load apply on vehicle by using LED.

By using ECU solenoid valve is actuated. If the piston moves forward, then the braking arrangement activated. This is how control the automated accident prevention system.



Block Diagram

#### IV. METHODOLOGY

- ❖ CatiaV5 should be used modeling .
- ❖ Design of electronics parts.

- ❖ Purchasing of Components like Pneumatic cylinder, FCV, Distance Sensor, force sensor, led, Microcontroller, Motors, Wheels, Battery(12V, 1.2A) etc.
- ❖ Manufacturing of Frame according to mechanical design.
- ❖ Purchasing of microcontroller system.
- ❖ Manufacturing of overloading system.
- ❖ Programming for distance sensor, force sensor and microcontroller.
- ❖ Evaluation of circuit and testing.
- ❖ Real time testing of system .

#### V. CONCLUSION

This project work has provided us an excellent opportunity and experience, to use our limited knowledge. We are feeling that we have completed the work within time successfully The PNEUMATIC BUMPER & BRAKE FOR FOUR WHEELER is working with satisfactory conditions. Thus we have prepared an “PNEUMATIC BUMPER & BRAKE FOR FOUR WHEELER ”which helps to know the how to achieve low cost product. The outcome of this study has highlighted the magnitude of the problem of vehicle overloading. Apart from the impact on pavement damage and carbon emission vehicle overloading would lead to more hazardous road environment because of the limitation in vehicle dynamic and braking. The current situation for controlling overloading passenger in public buses to be improved.

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