

# DESIGN & FABRICATION OF AUTOMATIC PNEUMATIC BRAKING SYSTEM

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## Abstract -

Today industrial world, Pneumatic system play a vital role, it is actually and arrangement of different elements in order to regulate, direct, sense and command itself to achieve the desired result.

In Pneumatic system working media is fluid power. The term fluid power related to the employment of fluid media under control conditions to perform some useful work. Fluid power in industries has been important in the development of automatic machinery and equipments for the use in industrial plants. The fluid media for power transmission has many advantages over the media of power transmission.

Vehicle accidents are ubiquitous in recent years. This is because of heavy increase in population of vehicles, due to its high demand. They pose a serious threat to life and property. A system must be designed to minimize the effects of these accidents. The aim of the present study is to design a device which can successfully scan the surroundings during driving and apply brake to avoid front end collision of the vehicle, along with extension of bumper. The technology of pneumatics 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 activation and automatic braking system is called automatic bumper system. IR sensor provided on the front end of the vehicle detects the presence of the obstacle. The use of pneumatic system can prove to be useful in automation due to its simplicity and ease of operation. So, the aim is to design and develop a system based on automatic control of vehicle. So, we aim to design "Automatic Pneumatic Braking System"

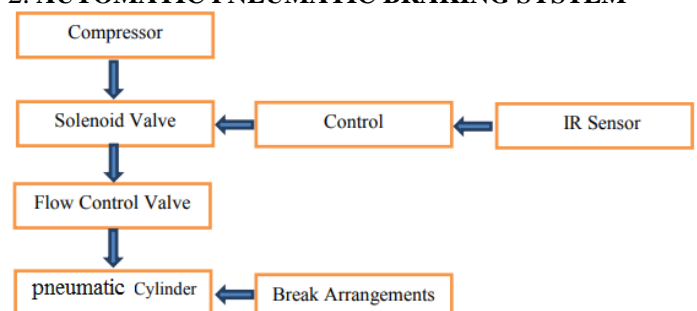
**Key Words:**, Braking System Pneumatic Braking templates, journals

## 1. INTRODUCTION

In the present study a model was designed to automatically forecast upcoming collision and take appropriate action and avoid collision by automatic braking and thus reduce the damage by automatic bumper circuit and to decrease response time by using high frequency waves. A safety system was designed to reduce property damage and passenger injury. All the conventional vehicles are equipped with brakes that are operated manually. The consequence of collision depends on driver's reflex to vary the driving environment. Vehicle accidents might be a consequence of rash driving, driving under influence, fatigue etc. Most of these can be mapped down to a single cause, driver's inability to hit the brakes at

right time. If this work is replaced by automatic means, most of the collision can be controlled. Automated collision avoidance system is one among such system to avoid the severity of accidents. It is an electrically controlled pneumatic circuitry, which aims to avoid forward collision of the vehicle and improve crashing safety. This is achieved by means of automatic pneumatic circuits. The aim is to design and develop a control system based on intelligent electronically controlled automotive bumper activation system is called "automatic pneumatic braking system". The project consists of IR transmitter and Receiver circuit, Control Unit, Pneumatic bumper system. The IR sensor senses the obstacle. There is any obstacle closer to the vehicle (within 1feet), the control signal is given to the bumper and break activation system. This bumper activation system is activated when the vehicle speed above 40-50 km per hour. The speed is sensed by the proximity sensor and this signal is transfer to the control unit and pneumatic bumper activation system. In collision mitigation system, the sensors detect the possibility of collision but will not take immediate action. A warning will be sent to the driver in the form of a signal or a voice message. There is a threshold safe distance calculated by the system and if the driver fails to respond even when the vehicle crosses that region, then only brakes will be applied automatically

## 2. AUTOMATIC PNEUMATIC BRAKING SYSTEM



Aim of the Automatic pneumatic braking system is to shield the life, property of car and driver with the assistance of the advance bumper circuit, connected with the solenoid valve, IR sensors and proximity sensors a vehicle can be protected by the collision of any obstacle. A threshold safe distance is already calculated if supposed that driver fails to response A symbol of warning is announce for the motive force and after crossing the edge distance brakes will apply automatically

## LITERATURE REVIEW

Srinivasa Chari.V et al (2018) reported that, if an obstacle is within 3-4 feet of the vehicle, a control signal is sent to the bumper activation system and the pneumatic braking system at the same time. Only when the vehicle speed exceeds 30-40 km/h is this bumper and braking system enabled.[1] Shinde Aniket S et al (2017) have conducted a study that the control signal is provided if there is some obstacle closer to the vehicle. braking machine with bumper activation system This smart braking system is a groundbreaking project aimed at avoiding or reducing the effects of frontal accidents that occur on congested roads. This system is built on the "Smart braking system with pneumatic bumper," a smart electrically controlled automatic bumper and brake activation system. This device also improves vehicle braking response time to maintain a healthy gap between two vehicles.

Mr. Lakhan Thombare et al (2016) studied and determined the failure to apply the brakes at the appropriate time is the most common reason given. Accidents can be avoided if the brakes are applied at the appropriate time. When compared to fully manual braking, automation will ensure greater braking efficiency. Because of its simplicity and ease of operation, pneumatic systems can be useful in automation. As a result, the aim is to design and implement a system based on vehicle automatic control. As a result, our aim is to create an "Intelligent Braking Device with Pneumatic Bumper."

Mayur K. Gadhave et al (2017) observed and reported, the aim is to design and build a control system based on "Intelligent Braking with Pneumatic Bumper," an intelligent electronically controlled automotive bumper activation system. The IR transmitter and receiver circuits, the Control

project work, a braking system is created that, when enabled, can apply brakes based on the object sensed by the ultrasonic sensor and the vehicle's speed. Vehicles are more often fitted with active protection systems to reduce the risk of collisions, which are common in urban areas. Antilock Braking Systems (ABS), Traction Control, and Stability Control are the most common. All of these systems use various types of sensors to continuously track the vehicle's conditions and respond in an emergency.

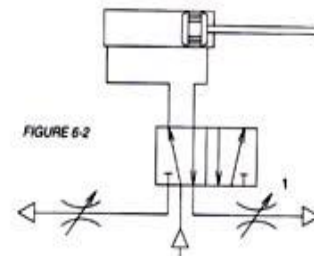
Lu Yi, Xu Bowen and Guo Bin (2015) proposed Experimental Verification, this study laid the groundwork for more structural brake component optimization and a fitness review of the pneumatic brake system.

S.Mithun et al (2014) the full modelling of each brake system products, including actuation valves, control valves, actuators, and foundation brakes, is described in this work. The response time of a typical 4X2 heavy commercial vehicle has been predicted. A comparison of the transient torque generated by the existing drum brake with an equivalent disc brake model was also conducted. The layout was created using the bond graph technique and a lumped system in one of the commercially

## WORKING OF SYSTEM

First of all the reservoir is filled with the compressed air. In reservoir at bottom one valve is present for moisture draining

Tubing connection done according to shown in circuit diagram



A five-ported two position valve provides two independent exhaust ports. In , independent flow controls may be mounted in each exhaust port to control cylinder exhaust and thus speed in both directions. When we operate the valve by hand lever and take the first position, the supply is directed to cylinder port (A) and the exhausting air is passed through a needle valve (1) during retraction, supply is directed to cylinder port (B) and needle valve (2) controls the exhausting air. This directional control valve has a definite advantage. First it eliminates the need of a bypass check valve being incorporated in the body of the flow control valve. Second, this circuit also offers the opportunity of fewer connections since the needle valve can be fastened into the valve exhaust ports and not in the connecting lines. On the other hand, when we operate the valve by hand lever and take the second position, the supply is directed to cylinder port (B) and the exhausting air is passed through a needle valve (2) during retraction, supply is directed to cylinder port (A) and needle valve (1) controls the exhausting air.

## 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 is working with satisfactory conditions. Thus we have prepared an "Automatic Pneumatic Braking System" which helps to know the how to achieve low cost product.

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