

AUTOMATIC PNEUMATIC BUMPER FOR TWO WHEELER

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ABSTRACT

The technology of pneumatic plays a major role in the field of automation and modern Machine shops space robots .The aim is to design and develop a control system based intelligent electrically controlled automotive bumper activation and automatic braking system .

This project of IR transmitter and receiver circuit controls, pneumatic bumper system and pneumatic braking system. The IR SENSOR senses the obstacle. There is any obstacle Closer to the vehicle (with in 3-4 feet), the control signal is given to the bumper activation system and also pneumatic braking system simultaneously.

The pneumatic bumper and braking and system this is used the men and vehicle, this bumper and braking activation system, this is activated when the vehicle the speed is above 30-40 km per hour. This vehicle speed is sensed by the proximity sensor and this given to the control unit and pneumatic bumper and braking activation system

Key words: - IR SENSOR, IR TRANSMITTER, IR RECEIVER PNEUMATIC CYLINDER, CONTROL UNIT ,RECEIVER, SOLENOID VALVE, AUTOMATIC PNEUMATIC BUMPER., IR SENSORE RAYS.

CHAPTER 1

INTRODUCTION

This fully equipped by IR sensors circuit and Pneumatic bumper and braking activation circuit. It is the project which has been fully equipped and designed for auto vehicles. 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 on intelligent electronically controlled automotive bumper activation system is called "automatic pneumatic bumper and break actuation before collision..

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.

The technology of pneumatics has gained tremendous importance in the field of work place rationalization and automation from old-fashioned timber works and coal mines to modern machine shops and space robots. It is therefore important that technicians and engineers should have a good knowledge of pneumatic system, air operated valves and accessories

We have pleasure in introducing our new project "AUTOMATIC PNEUMATIC BUMPER", which is fully equipped by IR sensors circuit and Pneumatic bumper activation circuit. It is a genuine project which is fully equipped and designed for Automobile vehicles. This forms an integral part of best quality. This product underwent strenuous test in our Automobile vehicles and it is good

The aim is to design and develop a control system based on pneumatic braking system of an intelligent electronically controlled automotive braking system. for comparison of iterative technologies techniques. The final phase of the new modern vehicle shall include now days all most all the manufacturing process is being atomized in order to deliver the product at faster rate .the manufacturing operation is being atomized the following reasons.

1. Development of improved ABS control systems
2. Development and assessment of an electro-hydraulic- BBW (EH-BBW) system
3. Individual wheel braking combined with traction control
4. Assessing sensor failure and fault tolerant control system design
5. Preliminary studies into an electrically actuated system

Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. The manufacturing operation is being atomized for the following reasons.

1.1 NEED FOR AUTOMATION

Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatics form an attractive medium for low cost automation. The main advantages of all pneumatic systems are economy and simplicity. Automation plays an important role in mass production.

For mass production of the product, the machining operations decide the sequence of machining. The machines designed for producing a particular product are called transfer machines. The components must be moved automatically from the bins to various machines sequentially and the final component can be placed separately for packaging. Materials can also be repeatedly transferred from the moving conveyors to the work place and vice versa.

Now days almost all the manufacturing process is being atomized in order to deliver the products at the faster rate. the manufacturing operation is being atomized for the following reasons.

- To achieve mass production
- To reduce man power
- To increase the efficiency of the plant
- To reduce the work load
- To reduce the production cost
- To reduce the production time
- To reduce the material handling

1.3 PNEUMATICS

The word "pneumatic" comes from Greek and means breath wind, for automation. Reflected IR rays and giving the control signal to the control circuit. The control circuit is used to activate the solenoid valve. The operating principle of solenoid valve already explained in the above chapter. Pneumatics has for some considerable time between used for carrying out the simplest mechanical tasks in more recent times has played a more important role in the development of pneumatic technology for automation. Pneumatic systems operate on a supply of compressed air which must be made available in sufficient quantity and at a pressure to suit the

capacity of the system. When the pneumatic system is being adopted for the first time, however it will indeed be necessary to deal with the question of compressed air supply. The key part of any facility for supply of compressed air.

The key part of any facility for supply of compressed air is by means using reciprocating compressor. A compressor is a machine that takes in air, gas at a certain pressure and delivered the air at a high pressure.

Compressor capacity is the actual quantity of air compressed and delivered and the volume expressed is that of the air at intake conditions namely at atmosphere pressure and normal ambient temperature.

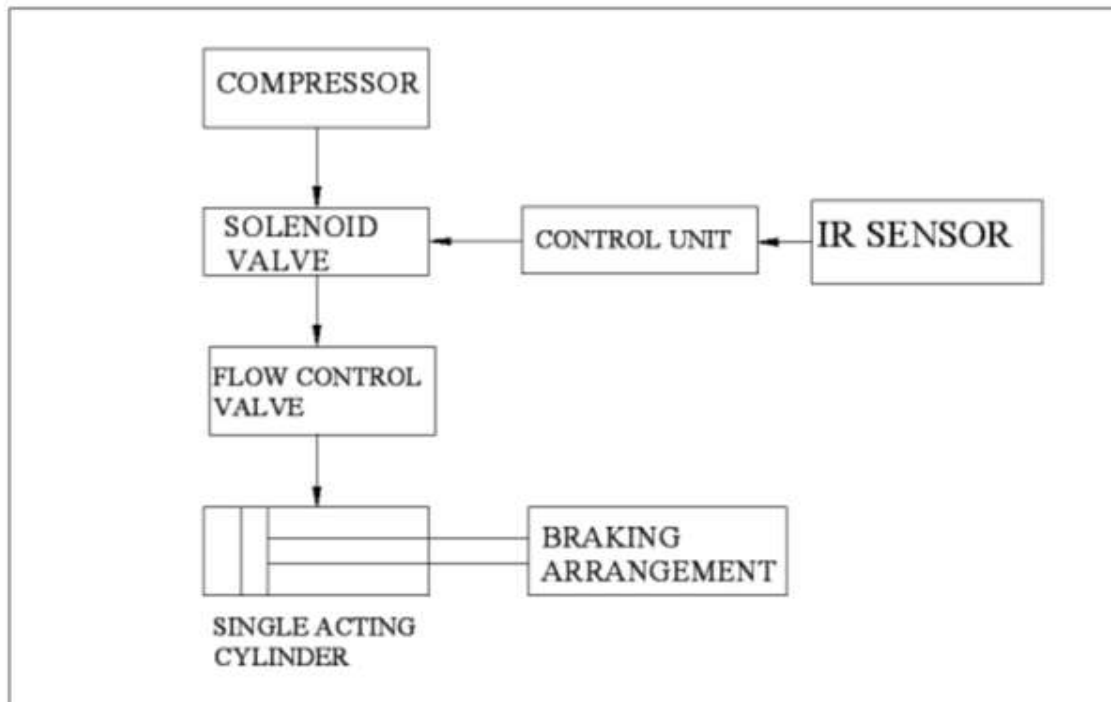


Fig -1 Circuit Diagram

CHAPTER 2

LITERATURE SURVEY

Mechanization is broadly defined as the replacement of manual effort by mechanical power. Pneumatics is an attractive medium for low cost mechanization particularly for sequential or repetitive operations. May be economic and can be advantageously applied to other forms of power).The main advantages of an all-pneumatic system are usually economy and simplicity, the latter reducing maintenance to a low level. It can also have outstanding advantages in terms of safety.

2.1 PNEUMATIC COMPONENTS AND ITS DESCRIPTION

The pneumatic bearing press consists of the following components to fulfill the requirements of complete operation of the machine.

1. Pneumatic single acting cylinder,
2. Solenoid valve
3. IR sensor
4. Unit Wheel and brake arrangement
5. PU connector
6. Reducer

7. Hose
8. Collar
9. Stand
10. Single phase induction motor.

PNEUMATIC SINGLE ACTING CYLINDER

Pneumatic cylinder consist of

1. PISTON
2. CYLINDER

The cylinder is a Single acting cylinder one, which means that the air pressure operates forward and spring returns backward. The air from the compressor is passed through the regulator which controls the pressure to required amount by adjusting its knob. Pressure gauge is attached to the regulator for showing the line pressure. Then the compressed air is passed through the single acting 3/2 solenoid valve for supplying the air to one side of the cylinder. One hose take the output of the directional Control (Solenoid) valve and they are attached to one end of the cylinder by means of connectors. One of the outputs from the directional control valve is taken to the flow control valve from taken to the cylinder. The hose is attached to each component of pneumatic system only by connectors.



Fig -2 Single Acting Cylinder

2.2 Working principle

Pneumatic circuit Pneumatic control systems can be designed in the form of pneumatic circuits. A pneumatic circuit is formed by various pneumatic components, such as cylinders, directional control valves, flow control valves, Pneumatic circuits have the following functions: To control the injection and release of compressed air in the cylinders. To use one valve to control another valve. Pneumatic circuit diagram pneumatic circuit diagram uses pneumatic symbols to describe its design. Some basic rules must be followed when drawing pneumatic diagrams..

A pneumatic circuit diagram represents the circuit in static form and assumes there is no supply of pressure. The placement of the pneumatic components on the circuit also follows this assumption. The pneumatic symbol of a directional control valve is formed by one or more squares. The inlet and exhaust are drawn underneath the square, while the outlet is drawn on the top. Each function of the valve (the position of the valve) shall be represented by a square.

If there are two or more functions, the squares should be arranged horizontally 3/2 directional control valve 3/2 directional control valve Arrows "↓↖" are used to indicate the flow

direction of air current. If the external port is not connected to the internal parts, the symbol “T” is used. The symbol “⊙” underneath the square represents the air input, while the symbol “∇” represents the exhaust. Example of a typical pneumatic valve. The pneumatic symbols of operational components should be drawn on the outside of the squares.

When the manual switch is not operated, the spring will restore the valve to its original position. . From the position of the spring, one can deduce that the block is operating. The other block will not operate until the switch is pushed. Air pressure exists along this line because it is connected to the source of compressed air. As this cylinder cavity and piston rod are under the influence of pressure, the piston rod is in its restored position.

The rear cylinder cavity and this line are connected to the exhaust, where air is released. One should place the pneumatic components on different levels and positions, so the relations between the components can be expressed clearly. This is called the setting of circuit diagrams. Cylinders with a large capacity require a larger flow of air, which can be hazardous to users. It is unsafe to manually operate pneumatic directional control valves with large flow capacity. This protects the solenoid from dirt and other foreign matter, and protects the actuator. In many applications it is necessary to use explosion proof solenoids.

CHAPTER 3 BRAKES

3.1 MECHANICAL BRAKE

THE vehicle, the wheel is attached to an auxiliary wheel called drum. The brake shoes are made to contact this drum. In most designs, two shoes are used with each drum to form a complete brake mechanism at each wheel. The brake shoes have brake linings on their outer surfaces. Each brake shoe is hinged at one end by on anchor pin; the other end is operated by some means so that the brake shoe expands outwards.

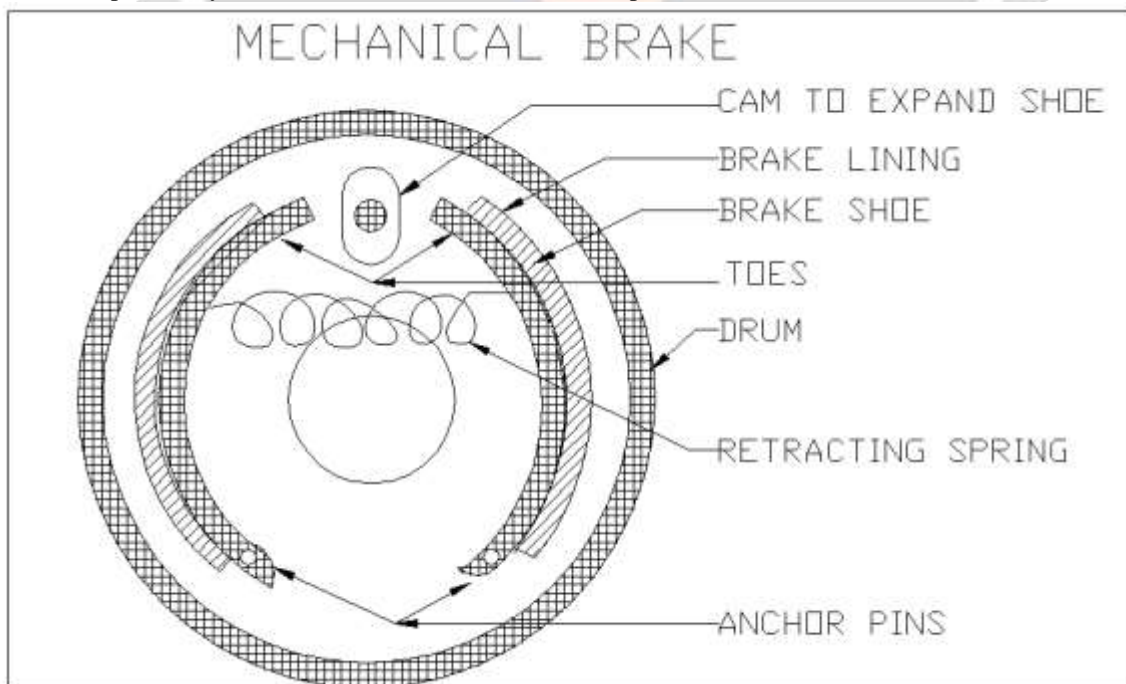


Fig-3 Mechanical Brake

The brake linings come into contact with the drum. Retracting spring keeps the brake shoe into position when the brakes are not applied. The drum encloses the entire mechanism to keep out dust and moisture. The wheel attaching bolts on the drum are used to contact wheel and drum.

The braking plate completes the brake enclosure, holds the assembly to car axis, and acts the base for fastening the brake shoes and operating mechanism. The shoes are generally mounted to rub against the inside surface of the drum to form as internal expanding brake as shown in the figure

3.2 HYDRAULIC BRAKE

The hydraulic brakes are applied by the liquid pressure. The pedal force is transmitted to the brake shoe by means of a confined liquid through a system of force transmission. The force applied to the pedal is multiplied and transmitted to brake shoes by a force transmission system. This system is based upon Pascal's principle, which states that "The confined liquids transmit pressure without loss equally in all directions". It essentially consists of two main components – master cylinder and wheel cylinder the master cylinder is connected by the wheel cylinders at each of the four wheels. The system is filled with the liquid under light pressure when the brakes are not in operation.

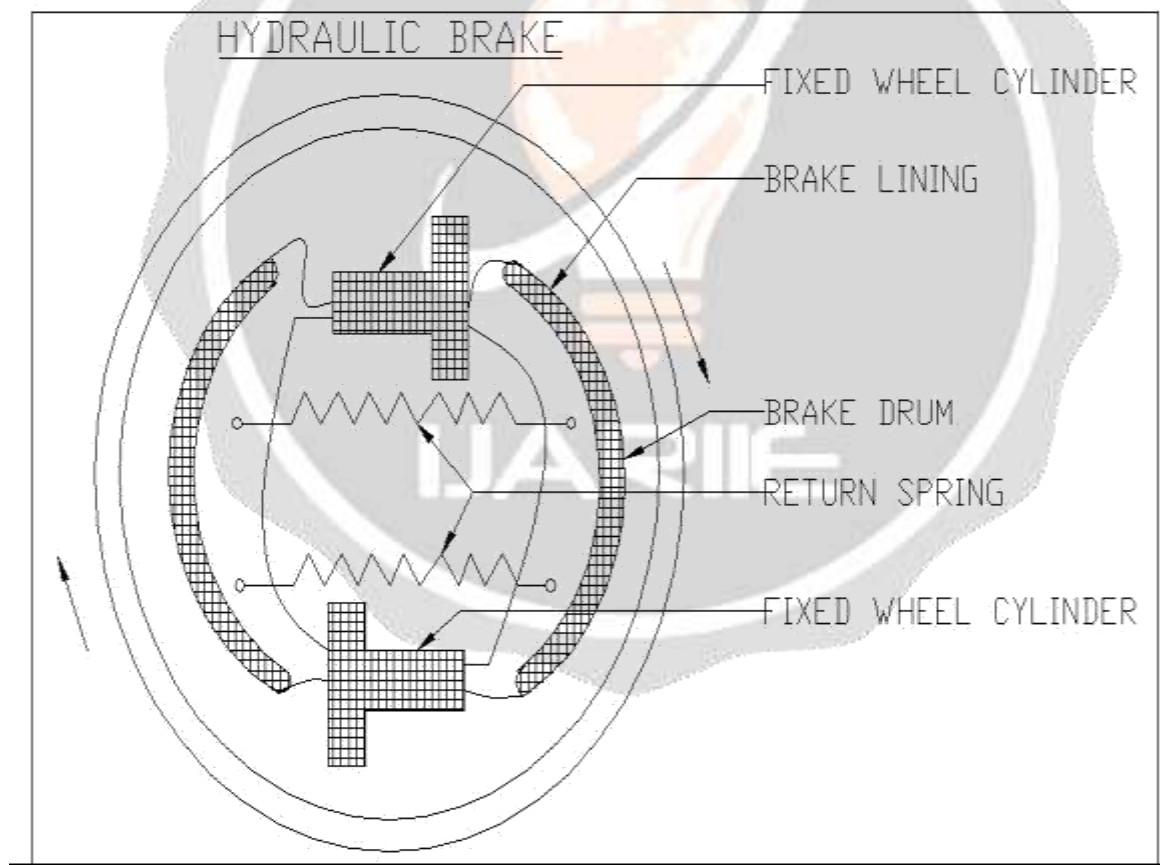


Fig .4 Hydraulic Brake

The liquid is known as brake fluid, and is usually a mixture of glycerin and alcohol or castor-oil, denatured alcohol and some additives Spring pressure, and thus the fluid pressure in .the entire system drops to its

original low valve, which allows retracting spring on wheel brakes to pull the brake shoes out of contact with the brake drums into their original positions. This causes the wheel cylinder piston also to come back to its original inward position. Thus, the brakes are released in our pneumatic system there are two types of connectors used.

4 CONCLUSIONS

This project work has provided us an excellent opportunity and experience we gained a lot of it is there for important that technician and engineering should be good knowledge and pneumatic system, assembling and machining while doing this project work. We feel that the project work is a good solution to avoid the accidents.

We are proud that we have completed the work with the limited time successfully. The PNEUMATIC BUMPER FOR TWO WHEELER is working with satisfactory conditions. We are able to understand the difficulties in maintaining the tolerances and also quality. We have done to our ability and skill making maximum use of available facilities. In conclusion remarks of our project work, project work. Thus we have developed "PNEUMATIC BUMPER FOR TWO WHEELER" which helps to know how to achieve low cost automation. The application of pneumatics produces smooth operation. By using more techniques, they can be modified and developed according to the applications.

ACKNOWLEDGEMENT

We thank our guide **DEPARTMENT OF MECHANICAL ENGINEERING ASSIST.PROFESSOR** of **Mr.G.KEDAR NATH** for his exemplary guidance, monitoring and encouragement that have helped us in completing our report. The help given to us and the path laid out for us has made us the better persons.

We also express our sincere thanks to **HEAD OF THE DEPARTMENT** Dr. S. NAGAKALYAN for providing for his spontaneous expressions of knowledge and his highly valuable suggestions which helped a lot in bringing up this project all through this academic year.

We express a whole hearted gratitude to our principle, **KOMMURI PRATAP REDDY INSTITUTE OF TECHNOLOGY** for providing us the conducive environment for carrying through our academic schedules and project with ease.

We gladly take this opportunity to express our profound gratitude as well as regards to Vice Chairman, **KOMMURI PRATAP REDDY INSTITUTE OF TECHNOLOGY** for providing an excellent environment and opportunity to nourish our skills for the betterment of our future.

We are obliged to all the staff members of **KOMMURI PRATAP REDDY INSTITUTE OF TECHNOLOGY**, for their knowledge shared with us in their respective fields and even more otherwise. We are grateful for their cooperation and support for us.

Lastly, we thank everyone else who have selflessly given us constant encouragement, without which this would not have been possible.

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