

DESIGN AND FABRICATION OF EMERGENCY ANTI-LOCK BRAKING SYSTEM

V MAHENDRA REDDY¹, Dr SCV RAMANAMURTHY NAIDU², S DASS³, SK ABDUL SADIKH GOUSE⁴,
CH RAVI KIRAN⁵, V MANISH⁶

¹Assistant Professor, Kallam Haranadhareddy Inst. of Tech., Guntur, AP-522 019

²Professor, Head of the Dept., Kallam Haranadhareddy Inst. of Tech., Guntur, AP-522 019

³Assistant Professor, Kallam Haranadhareddy Inst. of Tech., Guntur, AP-522 019

⁴Student, Kallam Haranadhareddy Inst. of Tech., Guntur, AP-522 019

⁵Student, Kallam Haranadhareddy Inst. of Tech., Guntur, AP-522 019

⁶Student, Kallam Haranadhareddy Inst. of Tech., Guntur, AP-522 019

Abstract: The technology of pneumatics has gained tremendous importance in the field of workplace 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. The air is compressed in an air compressor and from the compressor plant the flow medium is transmitted to the pneumatic cylinder through a well laid pipe line system. The technology of pneumatics has gained tremendous importance in the field of workplace 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. The air is compressed in an air compressor and from the compressor plant the flow medium is transmitted to the pneumatic cylinder through a well laid pipe line system.

Key Words: Antilock¹, Pneumatic², Air compressor³, rationalization⁴, coal mines⁵

1. INTRODUCTION

We have pleasure in introducing our new project of "EMERGENCY, INTELLIGENT AND ANTI LOCK BRAKING SYSTEM", which is fully equipped by IR sensors circuit and Pneumatic breaking 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 "PNEUMATIC BRAKING CIRCUIT" can stop the vehicle within 2 to 3 seconds running at a speed of 50 KM.

1.1 COMPONENTS AND DESCRIPTION

The components that are used in the project COMBINATION OF EMERGENCY, INTELLIGENCE AND ANTI-LOCK BRAKING SYSTEM are as follows,

- Control unit
- Wheel arrangement
- Pneumatic cylinder
- Bearings
- Motor
- Solenoid valve
- Belt
- Pulley
- Frame
- IR sensor

1.2 PRODUCT DESCRIPTION

AC MOTOR

- VOLT : 230V A.C
- RPM : 1440 RPM
- CURRENT : 2.5A
- PHASE : 1 PHASE

PNEUMATIC CYLINDER

- SIZE: DIA -45MM
- STROCK LENGTH: 100MM
- MATERIAL: ALUMINIUM /M.S
- PRESSURE: 10 BAR MAX

SOLENOID VALVE

- VOLT 12V/24V D.C
- TYPE: 1 INLET, 1 OUTLET, 1 EXHAUST
- PRESSURE: MAX 10 BAR
- THREAD SIZE: 1/4"

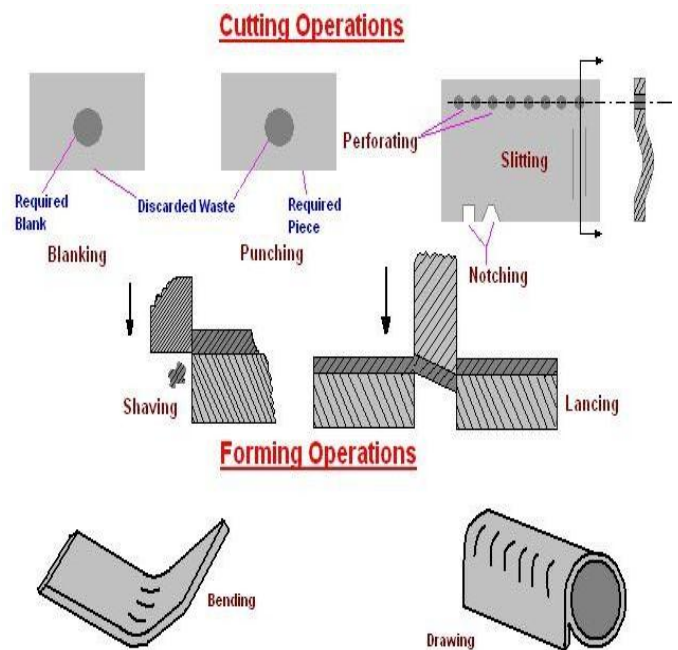
2. MANUFACTURING PROCESSES

Manufacturing involves turning raw material to finished products, to be used for various purposes. There are a large number of processes available. These processes can be broadly classified into four categories.

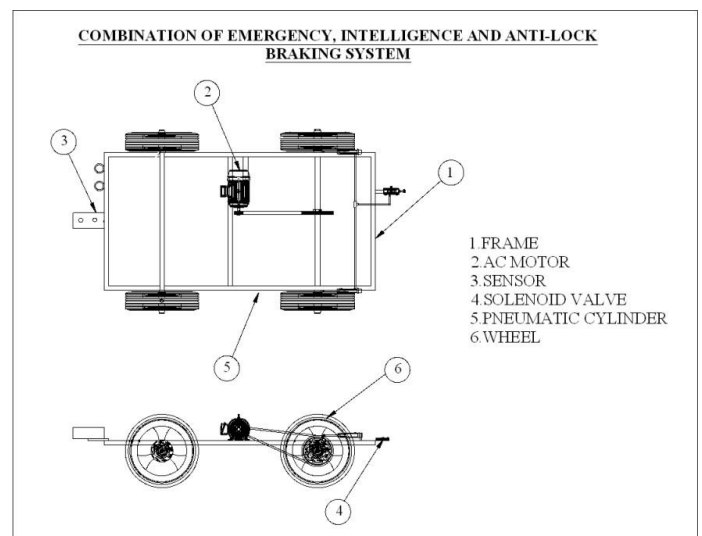
- Casting processes
- Forming processes
- Fabrication processes
- Material removal processes

3. WORKING PRINCIPLE:

The **IR TRANSMITTER** circuit is to transmit the Infra-Red rays. If any obstacle is there in a path, the Infra-Red rays reflected. This reflected Infra-Red rays are received by the receiver circuit is called "**IR RECEIVER**". The IR receiver circuit receives the 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 is already explained in the above chapter. If the solenoid valve is activated, the compressed air passes to the Double Acting Pneumatic Cylinder. The compressed air activate the pneumatic cylinder and moves the piston rod. If the piston moves forward, then the breaking arrangement activated. The breaking arrangement is used to break the wheel gradually or suddenly due to the piston movement. The breaking speed is varied by adjusting the valve is called "**FLOW CONTROL VALVE**". In our project, we have to apply this breaking arrangement in one wheel as a model. The compressed air drawn from the compressor in our project. The compressed air flow through the Polyurethane tube to the flow control valve. The flow control valve is connected to the solenoid valve as mentioned in the block diagram. The Ignition Key is fixed in near of the driving persons in the four wheeler. The air tank contains the compressed air already filled. The switch was ON at the time of emergency, the solenoid valve was activated.



4. 2D DRAWING:



5. ADVANTAGES, DISADVANTAGES AND APPLICATIONS:

ADVANTAGES

- Brake cost will be less.
- Free from wear adjustment.
- Less power consumption
- Less skill technicians is sufficient to operate.
- It gives simplified very operation.

- Less time and more profit.
- It requires simple maintenance cares
- The safety system for automobile.

DISADVANTAGES

- Initial cost is high.
- High maintenance cost
- Need separate air tank
- This system applied in the case of emergency period only.
- Addition cost is required to install this system to four wheeler.

APPLICATIONS:

- For automobile application
- Industrial application
- Thus it can be useful for the following types of vehicles;
1) Maruti, 2) Ambassador, 3) Fiat, 4) Mahindra, 5) Tata

6. LIST OF MATERIALS:

Sl. No.	PARTS	Qty.	Material
1	Frame	-	MS
2	Ac motor	1	230v AC
3	Pneumatic cylinder	2	-
4	Solenoid valve	1	-
5	Wheel	4	-
6	bearing	4	Steel
7	Belt	1	Nylon
8	Pulley	2	CI/MS
9	IR sensor	1	-

7. CONCLUSIONS:

Strong multidiscipline team with a good engineering base is necessary for the Development and refinement of advanced computer programming, editing techniques, diagnostic Software, algorithms for the dynamic exchange of informational different levels of hierarchy. This project work has provided us an excellent opportunity and experience, to

use our limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We are proud that we have completed the work with the limited time successfully. The **“COMBINATION OF EMERGENCY, INTELLIGENCE**

AND ANTI-LOCK BRAKING SYSTEM” is working with satisfactory conditions. We are able to understand the difficulties in maintaining the tolerances and also quality.

REFERENCE:

- G.B.S.Narang, “Automobile Engineering”, Khanna Publishers, Delhi, 1991, pp 671.
- William H. Crowse, “Automobile Engineering”.
- Donald. L. Anglin, “Automobile Engineering”.
- Pneumatic Control System----Stroll & Bernaud, TatMc Graw Hill Publications, 1999.
- Pneumatic System----Majumdhara, New Age India International (P) Ltd Publishers, 1997.

Web sites:

- www.Profc.udec.cl/~gabriel/tutorials.com
- www.carsdirect.com/features/safetyflatures
- www.hwysafety.org