



## THREE AXIS PNEUMATIC MODERN TRAILER

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**Abstract:** This project work titled “THREE AXIS PNEUMATIC MODERN TRAILERS” has been conceived having studied the difficulty in unloading the materials. Our survey in the regard in several automobile garages, revealed the facts that mostly some difficult methods were adopted in unloading the materials from the trailer. Now the project has mainly concentrated on this difficulty, and hence a suitable arrangement has been designed. Such that the vehicles can be unloaded from the trailer in three axes without application of any impact force. By pressing the Direction control valve activated. The compressed air goes to the pneumatic cylinder through the valve. The ram of the pneumatic cylinder acts as a lifting trailer cabin. The automobile engine drive is coupled to the compressor engine, so that it stores the compressed air when the vehicle is running. This compressed air is used to activate the pneumatic cylinder when the valve is activated.

**Key Words:** *Pneumatic, Kinematic Mechanism, Trailer.*

**Index Terms –** *Solar Still, Solar Energy, Analysis, Temperature.*

### I. INTRODUCTION

Material handling in construction and civil works is one of the necessities. The material supply to civil and construction is provided through trucks, dumpers etc. The material should be properly loaded, managed, stacked, transported and unloaded. The dumper carries the material, which is loaded from the site, where the material is initially stored. It is then loaded to the dumper and transported to the required site and then unloaded. The major issues raised over here, the incompatibility of the site with the fully loaded dumper causes a lot of settling time for the trolley to get the material properly arranged and transportation time to reach its location. The dumper unloads the material in only one direction.

But this incapability can be a full new method mechanism as the Three Axis Modern Pneumatic Trailer. Gothic mechanism is an approach to reduce the idle time to settle the dumper. The material is unloaded in any direction and hence can be boldly stated as three axis modern pneumatic trailer. The major outcomes of three axis modern pneumatic trailer. Has overcome space requirements which often result in road blocking. Hence, we have inversion in the existing mechanism providing the unloading in 180 rotations. This mechanism prevents blocking of roads, saves time, and enhances productivity at lowest cost. The automotive sector is a fast-booming sector in India. There are variables in the automotive industry light and heavy motor vehicles. heavy duty vehicle support as the backbone and confront to the working. a dumper whose material can easily be unloaded in one direction that is mostly to its rear end. This inefficiency has been overcome by a three-axis modern pneumatic trailer. Automation can be achieved through computers, hydraulics, pneumatics, robotics

### II. PROBLEM STATEMENT

This project has mainly concentrated on the difficulties arising while unloading the material from a dumper or trailer and hence a suitable arrangement has been designed. Such that the vehicles can unload material from the trailer in three axes without application of any impact forces.

### III. EXPERIMENTAL SETUP

Since the pneumatic circuit plays a vital role in this device, it is very necessary to explain the working of this circuit. Initially starting with air compresses, its function is to compress air from a low inlet pressure (usually atmospheric) to a higher-pressure level. This is accomplished by reducing the volume of the air. Air compressors are generally positive displacement units and are either of the reciprocating piston type or the rotary screw or rotary vane types. The air compressor used here is a typically small sized, two-stage compressor unit. It also consists of a compressed air tank, electric rotor and pulley drive, pressure controls and instruments for quick hook up and use. The compressor is driven by a 1 HP motor and designed to operate in the 10 – 100 PSI

range. If the pressure exceeds the designed pressure of the receiver a release valve provided releases the excess air and thus stays ahead of any hazards to take place. Then having a pressure regulator where the desired pressure to operate is set. Here a variable pressure regulator is adopted. Through a variety of direction control valves are available, a hand operated spool valve with detent is applied. The spool valve used here is 5 ports, 3 positions. There are two exhaust ports, two outlet ports and one inlet port. In two extreme positions only the directions can be changed while the Centro ore is a neutral position and no physical changes are incurred. The 2 outlet ports are connected to an actuator (Cylinder). The pneumatic activates a double acting, single rod cylinder. The cylinder output is coupled to further purpose. The piston end has an air honing effect to prevent sudden thrust at extreme ends.

## CIRCUIT DIAGRAM

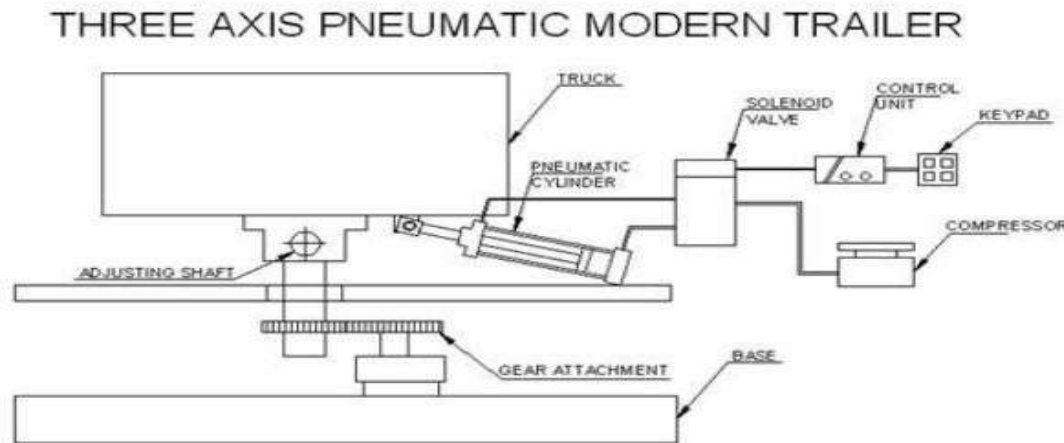


Fig. 1 circuit diagram of three axis pneumatic trailer

## IV. OBJECTIVES

- To Solve the Material unloading Problem of Dumping Trailers in crunch situations and narrow road site area.
- To achieve Low cost automation Model of unloading of material.
- To increase efficiency of dumping trailers while unloading the material.
- To reduce manpower and save time while unloading the materials.
- To combine pneumatics and micro controllers in our model.
- To achieve higher safety of workers during the work time.

## V. RESULTS & DISCUSSION

The compressed air from the compressor reaches the direction control valve. The direction control valve changes the direction of flow according to the valve position handle. The compressed air passes through the direction control valve and it is admitted into the front end of the cylinder block. The air pushes the piston for the lifting stroke. At the end of the lifting stroke air from the valve reaches the rear end of the cylinder block. The pressure remains the same but the area is less due to the presence of a piston rod. This exerts greater pressure on the piston, pushing it at a faster rate thus enabling faster return stroke. The stroke length of the piston can be changed by making suitable adjustment in the hand lever valve operating position.

## VI. CONCLUSION

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 feel that the project work is a good solution to bridge the gates between institutions and industries.

We are proud that we have completed the work with the limited time successfully. The “THREE AXIS PNEUMATIC MODERN TRAILER” is working with satisfactory conditions. We are able to understand the difficulties in maintaining tolerances and also quality. We have done our ability and skill making maximum use of available facilities. In conclusion remarks of our project work, let us add a few more lines about our impression of project work.

Thus we have developed a “THREE AXIS PNEUMATIC MODERN TRAILER” which helps to know how to achieve low cost automation. The operating procedure of this system is very simple, so any person can operate. By using more techniques, they can be modified and developed according to the applications.

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