

THREE AXIS PNEUMATIC MODERN TROLLEY MECHANISMS

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ABSTRACT:

This project work titled "THREE AXIS PNEUMATIC MODERN TROLLEY MECHANISM" 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 is goes to the pneumatic cylinder through valve. The ram of the pneumatic cylinder acts as a lifting the trailer cabin. The automobile engine drive is coupled to the compressor engine, so that it stores the compressed air when the vehicle running. This compressed air is used to activate the pneumatic cylinder, when the valve is activated.

INTRODUCTION

Automation can be achieved through computers, hydraulics, hydraulics, robotics, etc., of these sources, hydraulics form an attractive medium. Automation plays an important role in

automobile. Nowadays almost all the automobile vehicle is being atomized in order to product the human being. The automobile vehicle is being atomized for the following reasons.

- To achieve high safety
- To reduce man power
- To increase the efficiency of the vehicle
- To reduce the work load
- To reduce the fatigue of workers
- To high responsibility
- Less Maintenance cost

WORKING PRINCIPLE

Since 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 an 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 driver by a 1 HP motor and designed to operate in 10 – 100 PSI range. If the pressure exceeds the designed pressure of the receiver a release value provided releases the excesses air and thus stays a head of any hazards to take place.

Then having a pressure regulator where the desired pressure to the operated is set. Here a variable pressure regulator is adopted. Through a variety of direction control value are available, a hand operated spool value with detent is applied.

The spool value 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 is a double acting, single rod cylinder. The cylinder output is coupled to further purpose. The piston end has an air horning effect to prevent sudden thrust at extreme ends.

❖ 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 pass 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 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 liver valve operating position.

APPLICATIONS

All hydraulic and pneumatic dipper applications

CONCLUSION

Thus we have developed a “THREE AXIS PNEUMATIC MODERN TROLLEY MECHANISM” 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.

REFERENCES

1. G.B.S. Narang, “**Automobile Engineering**”, Khanna Publishers, Delhi, 1991, pp 671.
2. William H. Crowse, “**Automobile Engineering**”.
3. MECHANISMS IN MODERN ENGINEERING DESIGN Vol. V. PART I
4. ELEMENTS OF WORKSHOP TECHNOLOGY – VOL II
-S.K. HAJRA CHOUDHURY
-S.K. BOSE
-A.K. HAJRA CHOUDHERY
5. STRENGTH OF MATERIALS -I.B. PRASAD