

THREE AXIS PNEUMATIC MODERN TRAILER

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ABSTRACT

Trailer has lots of applications in today's world. In industrial and domestic considerations, tippers can pull a variety of products including gravel, grain, sand, fertilizer, heavy rocks, etc. By considering wide scope of the topic, it is necessary to do study and research on the topic of tipper mechanism in order to make it more economical and efficient. In existing system, tipper can unload only in one side by using pneumatic jack or conveyor mechanism. By this research it is easy for the driver to unload the trailer and also it reduces time and fuel consumption. For making tipper mechanism with such above conditions hydraulic jack mechanism can be used. This paper has mainly focused on above difficulty. Hence a prototype of suitable arrangement has been designed. The vehicles can be unloaded from the trailer in three axes without application of any impact force. The Direction control valves which activate the ram of the hydraulic cylinder which lifting the trailer cabin in require side. By this research it is easy for the driver to unload the trailer and it reduces the time.

Keywords: Pneumatic system, valves, trailer

I. INTRODUCTION

A dumper is a vital part of any development work and henceforth its part is imperative for finish of any constructional site. One of the issues connected with dumper is the time and vitality required for setting the enormous dumper in the best possible bearing. To beat this issue the need of the venture work emerge which is around 3 way dropping dumper which can dump the material in any heading

aside from the rental one without moving the truck. A three-way tipper can empty materials in each of the three bearings. The car motor drive is coupled to the compressor, with the goal that it stores the compacted air when the vehicle is running. To control the development of tipper on both sides, two more pneumatic barrels are required. Likewise we require exceptional sorts of pivot joints for this situation. This tipper instrument can empty the products in

three headings. This tipper instrument for the most part identifies with ball attachment joint for emptying the material in left side or in right side bearing and utilization of water driven jack in posterior. This paper speaks to the upsides of three tomahawks trailer and its proficiency of utilization over the customary trailer.

A. Problem Statement

It is exceptionally hard to empty the materials in right side or left half of the trailer. By squeezing the course control valve, the packed air goes to the pneumatic barrel through valve; the ram of the pneumatic chamber get initiated and lift the trailer lodge. The car motor drive is coupled to the compressor motor, with the goal that it stores the compacted air when the vehicle is running. This compacted air is utilized to initiate the pneumatic barrel, when the valve is opened.

B. Selection of Pneumatics

Automation is comprehensively characterized as the substitution of manual exertion by mechanical force. Pneumatic is an alluring medium for minimal effort automation especially for successive or dull operations. The pneumatic framework is typically financial and straightforward, with less support. It can likewise have remarkable favorable circumstances as far as security.

2.LITERATUREREVIEW

Ganesh shinde, the author says three way modern trailers has neutralize the dumping problem in unloading.

He says that several automobile garage has the fact, some difficult methods in unloading the material in normal traders.

Amboji Sudhakar R, the author said that trailers in tippers are used to transport variety of products including gravel, potatoes, sand, grain, compost and heavy rocks.He notice the term that tipper trailers can unload in one side which is x axis only by using hydraulic jack or conveyor mechanism.

3.CONSTRUCTION

The three axis pneumatic trailer construction which is similar to single axis trailer in this we use pneumatic double acting cylinder instead of hydraulic cylinder The pneumatic cylinder is working with compressed air which is used to lift the load The figure source that the compressed air is passed through the solenoid to reach the pneumatic cylinder The compressed air is helps to lift the load as air is compressed with the help of air compressor.

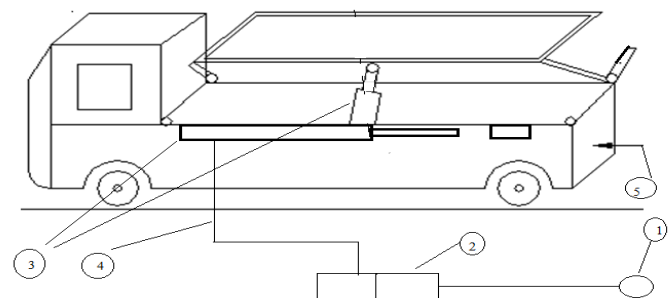
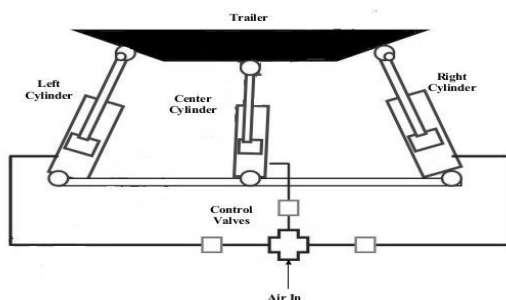


Fig 3.1 layout**4. WORKING PRINCIPLE**

1. Air compressor
2. Direction control valve
3. Cylinder
4. Connecting hoses
5. Flow control valve
6. Wheel arrangement
7. Vehicle model frame

In the modern three axis pneumatic trailer the air circuit plays a vital role. First we, start the compressing of the air, the atmospheric air which is normal pressure is taken by the reciprocating compressor and converting to high pressure depending on the requirement. The compressed air is carried with the help of polyethylene tube in to the solenoid the compressed air is supplied to the compressed air should have a drain to drain the water accumulated in the tank air moisture condensation. The compressed air is now passed to the pneumatic cylinder. The cylinder have a capacity of

**Fig 4.1 working process****5. ADVANTAGES**

1. We can unload the loads in all three directions.
2. The lifting cost will be low comparing to hydraulic jack
3. The maintenances is very less
4. Less space required for vehicle to unload.

6. DISADVANTAGES

1. Higher compressed air should be used
2. Initial cost is less
3. Stability is less

7. APPLICATION

1. It can be used for agricultural purposes.
2. It can be economically used in large construction sites.
3. This modern three way trailer is very useful where time is the important factor for completion of work.

8. FUTURE SCOPE

As the world is progressing at faster rate we need more efficiently working equipments and vehicles. The three axes lifting modern hydraulic trailer can be used more efficiently two ways or one way trailer.

The three axes trailer can be modified further more on following basis:-

- A. Dual stage cylinders can be used.
- B. Oil pump can be used instead of powered cylinder.
- C. Capacity can be increased as per the requirement.

D. Wheel steering system can be adopted for avoiding the lifting of vehicle along with trailer.

9. CONCLUSION

This work has given us a great chance to utilize the subject information of Hydraulics and Pneumatics to minimize human exertion and work effectively in less accessible space pick up. Further adjustments will put this work in the fundamental group of utilization. This idea spares time and vitality which prompts productive working. The three tomahawks advanced trailer furnishes us with more odds of working under basic and congested condition on locales of development and mines, where accessible space is less to work a trailer. The locking framework empowers us to improve the level opportunity for the development.

REFERENCES

- [1] Ganesh shinde prachi tawele, and laukik raut , design and development of 3-way Dropping Dumper,4(9),2014,2250-2459.
- [2] Amboji sudhakar R.,Human yogesh A,International journal of research in advent technology,2(4),2014,2321-9637.