

Multi-Axis Pneumatic Modern Trailer

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Abstract: *The efficiency and versatility of material handling systems play a pivotal role in various industrial sectors. Among these systems, pneumatic trolleys have emerged as a promising solution due to their adaptability and ease of operation. This research paper delves into the design, development, and implementation of a multi-axis pneumatic trolley, aiming to enhance its maneuverability and efficiency in material transportation tasks.*

The study begins with an exploration of existing pneumatic trolley designs and their limitations, emphasizing the need for improved mobility and functionality. Subsequently, a comprehensive analysis of pneumatic control systems and their potential for multi-axis movement is conducted. Through theoretical modelling and simulation techniques, the paper investigates the feasibility and performance of various pneumatic control strategies for achieving multi-axis motion.

Furthermore, the research presents the design methodology employed in developing the multi-axis pneumatic trolley, focusing on key components such as actuators, valves, and control mechanisms. Experimental validation of the prototype is carried out in a simulated industrial environment, assessing its maneuverability, load-bearing capacity, and energy efficiency.

The findings of this study demonstrate the effectiveness of the proposed multi-axis pneumatic trolley in improving material handling operations. By enabling precise control over multiple axes of movement, the trolley offers enhanced manoeuvrability in confined spaces and complex environments. Additionally, the integration of pneumatic control systems facilitates seamless coordination and synchronization of motion, leading to optimized efficiency and productivity. This research paper is only for education purpose.

Keywords: Multi-axis, Pneumatic, Trolley, Material Handling, Mobility, Efficiency, Control Systems, Actuators, Maneuverability

REFERENCE'S

- [1]. <https://issuu.com/irjet/docs/irjet-v9i5419>
- [2]. <https://learnmech.com/three-axis-pneumatic-modern-trailer-mechanical-projec/>
- [3]. <https://www.scribd.com/document/401813678/Fabrication-of-Three-Axis-Pneumatic-Modern-Trailer>
- [4]. <https://www.shieldtechno.com/mechanical-projects/pneumatics-or-hydraulics-projects-in-bangalore.php>
- [5]. Bharth G., Sunil Kumar K., Srinivasa Chari V., Lakshiminarayana T.H., "Pneumatic Three Axis Modern Trailer", "International Journal for Research in Applied Science & Engineering Technology (IJRASET)", Volume 4 Issue V, page 891-901, May 2016
- [6]. Prof. Deshmukh.S.A., Lonkar Pradip P., Bhong Tushar H., Kale Dadaso B., "Three Axis Pneumatic Modern Trailer by Using Single Cylinder", "International Journal of Recent Research in Civil and Mechanical Engineering (IJRRCE)", Vol.2, Issue 2, Page111-126, October 2015–March 2016.
- [7]. Patel Umang M, Patel Shailesh H, Patel Sandip J, Mr. Rahul M Desai, "Three Axis Pneumatic Trailer", "International Journal of Advance Research and Innovative Ideas in Education (ISSN(O)-2395-4396)", Vol-4, Issue-3, 2018, Page: 53-63.