

Design, Analysis and Manufacturing of Double Scissors Lift Elevated by One Hydraulic Cylinder

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Abstract - The following paper describes the design, analysis and manufacturing of a hydraulic scissor lift having two levels elevated by one hydraulic cylinder. Scissor lifting machine is hydraulically operated with makes lifting simple by sliding bending onward to lift manually because the table is regulating to be lifted at a preferred height. There are predominantly hundreds of workers for lift tables in industrial, warehousing and delivery services. The addition of this device (lift table) makes job quicker, harmless and easier. The overall objective of this paper is to design and manufacture a double scissors lift device elevated by one hydraulic cylinder that can be used in the automobile sector. The machine is tested by lifting different weights and it is successful and can lift up to the recommended weight of 270kg efficiently without any problem. Drafting & drawing of hydraulic system scissor lift is done using solid works.

Key words - Scissor lifting; lift table; hydraulic cylinder automobile sector; Solid works

I. INTRODUCTION

A scissor lift is a vertical lifting device that consists of a platform. The mechanism incorporated to achieve this function is the use of linked, folding supports in a crisscross pattern, known as a pantograph [1]. A scissor lift provide the most economic, dependable and versatile methods of lifting loads, it has a few moving parts, which may only require lubricated. This lift table raises the load smoothly to any desired height. This mechanism is incorporated with a hydraulic cylinder and the top of the scissors is attached a table platform. This device will make use of the power generated from a hydraulic cylinder to raise or lower a platform. The scissor lifts can be classified as follows: Hydraulic lifts, pneumatic lifts and mechanical lifts.

Hydraulic scissor lifts are very powerful tool for applying a ton of force on the platform plate of component which is equally distributed on scissor arms [2].

A properly designed and equipped scissor lift enhances the logistic infrastructure, improving facility's competitiveness. They are provide optimum solution for lifting awkward shaped objects to comfortable working heights with least worker fatigue and physical strain. It also reduces back and muscle injuries by avoiding inappropriate manual lifting techniques. Besides these it helps to save time. The beneficiaries are those who are working directly on lifting parts in automotive assembly and repair sector. This paper

presents the design and manufacturing of a scissors lift elevated by one hydraulic cylinder for the automotive industry.

The drawing of hydraulic scissor lift was done using solid works. Figure 1 shows the 3D modeling of double hydraulic scissor lift.



Fig.1. 3D modeling of hydraulic scissor lift

II. DESIGN ANALYSIS

Concept selection

The design was selected from an already made product in the market with modification in various parts and section to further enhance the functionality of the design.

Design considerations

Considerations made during the design and fabrication of a portable work platforms being elevated by one hydraulic cylinder is as follows:

- Functionality of the design
- Manufacturability
- Economic availability, that is general cost of materials and fabrication techniques employed.

Research carried out in the automotive industry reveals that one of the heaviest components of the automobile car is the car engine which is of average weight of 272 kg. By this factor, the control weight would be 280 kg for safer design of the scissor lift table platform for assembly purposes in the automotive industry.

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Mechatronics and Automation Technology J.-Y. Xu,2024-02-15 Mechatronics and automation technology has led to technological change and innovation in all engineering fields affecting various disciplines including machine technology electronics and computing It plays a vital role in improving production efficiency reducing energy consumption and improving product quality and safety and will be central to the further advancement of technology and industry bringing convenience and innovation to even more areas This book presents the proceedings of ICMAT 2023 the 2nd International

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Design and analysis of a universal hydraulic scissor lift Rashem Pandit,Prashant Misal,Mayur Khillare,2017-11-23 Bachelor Thesis from the year 2015 in the subject Engineering Mechanical Engineering grade 3.0 Savitribai Phule Pune University formerly University of Pune Pune Vidyarthi Griha s College of Engineering and Technology course Mechanical Engineering language English abstract The position of center of gravity of a vehicle plays a very important role in the dynamics of the vehicle It needs to be balanced in the lateral direction Its position in the longitudinal direction and its height has an important role in the design of the braking system It also has an effect on the suspension geometry of a vehicle Now for finding out the Center of gravity of any vehicle it needs to be lifted at some required height from one end A vehicle has tremendous weight and therefore a huge lifting force is required To be able to carry out such a task hydraulic systems are generally used Out of the various hydraulic systems hydraulic scissor lift is the best suitable option for carrying out this function Nowadays scissor lifts are being used for various applications such as aerial work platforms lift tables etc Our project is an innovative application of scissor lifts to find out the Center of gravity of a vehicle

ICICA 2022 Johan Debayle ,Guangwei Bai,Shuangming Yang,2023-03-27 The

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Thomas Register of American Manufacturers, 2003 Vols for 1970 71 includes manufacturers catalogs

Future Trends

in Production Engineering Günther Schuh,Reimund Neugebauer,Eckart Uhlmann,2012-08-15 To meet and adapt to the current and future trends and issues in technology and society the science committee of The German Academic Society for Production Engineering WGP continues to define future topics for production technology These themes represent not only the key focus for the scientific work of the WGP but also the central themes of the first annual conference in June 2011 whose paper is publically available in this volume Such themes including electric mobility medical technology lightweight construction and resource efficiency as well as mass production ability have all been identified as future large scale and long term drivers of change Future trends influence changes sustainably and fundamentally they permeate society technology economics and value systems and have an effect in virtually all areas of life The WGP has as part of its research established for itself the goal of not only observing these emerging changes but also of supervising and influencing their development in order to ensure steady progress secure sustainability and shape the future *Trends and Applications in Mechanical Engineering, Composite Materials and Smart Manufacturing* Padhi, Surya Narayan,2024-08-14 The fields of Mechanical Engineering Composite Materials and Smart Manufacturing find themselves at the heart of a pivotal predicament As these industries grapple with the demands for efficiency sustainability and innovation a need arises for a unified exploration of the transformative solutions within these domains At this crucial moment researchers academics and practitioners worldwide need to focus on understanding and solving the complex issues that are hindering progress Trends and Applications in Mechanical Engineering Composite Materials and Smart Manufacturing delves into solutions that propel industries economies and societies into a future defined by progress and resilience At its core this book strives to examine the disciplines of mechanical engineering composite materials and smart manufacturing With the collaborative efforts of diverse experts it attempts to create a comprehensive resource that not only identifies emerging trends but also unveils their impact on the real world By acting as a driving force for advancing current research bridging knowledge gaps and presenting innovative solutions the publication contributes significantly to the collective understanding of these disciplines The goal is to empower scholars educators and professionals with the knowledge and insights required to sculpt the future of these increasingly complex industries Furniture Production ,1972 **Applied Science & Technology Index** ,1981

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