

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.

Design Manufacturing Analysis Of Hydraulic Scissor Lift

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Progress in Engineering Technology V Muhamad Husaini Abu Bakar, Tajul Adli bin Abdul Razak, Andreas Öchsner, 2023-05-27 The book contains a selection of peer reviewed papers from the 2022 conferences which took place at the Universiti Kuala Lumpur Malaysian Spanish Institute UniKL MSI Kedah Malaysia This book contains twenty two papers written by researchers participating in the conferences Topics covered in this book include composite materials thermodynamics vibration dynamics of structures manufacturing processes computer aided manufacturing CFD analysis design and optimization of devices and procedures The topics are commonly encountered in industries and become an interest in the academic world The learning of engineering technology s curricular across universities is now an essential topic covered in various higher learning institutions Therefore it is hoped that this book serves as an excellent reference for researchers and graduate students working with on multidisciplinary engineering technology *Recent Advances in Mechanical Engineering* Seshadev Sahoo, Natraj Yedla, 2024-05-14 This book presents select proceedings of the fourth International Conference on Recent Advances in Mechanical Engineering Research and Development ICRAMERD 2023 The contents focus on latest research and current problems in various branches of mechanical engineering Some of the topics discussed include fracture and failure analysis fuels and alternative fuels combustion and IC engines advanced manufacturing technologies powder metallurgy and rapid prototyping industrial engineering and automation vibrations and control engineering automobile engineering fluid mechanics and machines heat transfer composite materials micro and nano engineering for energy storage and conversion and modeling and simulations The book is useful for researchers and professionals in mechanical engineering *Machine and Industrial Design in Mechanical Engineering* Milan Rackov, Aleksandar Miltenović, Milan Banić, 2025-01-01 This book gathers the latest advances innovations and applications in the field of machine science and mechanical engineering as presented by international researchers and engineers at the 12th International Conference on Machine and Industrial Design in Mechanical Engineering KOD held in Balatonfured Hungary on May 23 26 2024 It covers topics such as mechanical and graphical engineering industrial design and shaping product development and management complexity and system design The contributions which were selected by means of a rigorous international peer review process highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaborations **Proceedings of the 2022 International Conference on Smart Manufacturing and Material Processing (SMMP2022)** A. Nayyar, 2022-11-29 Smart manufacturing is a broad category of manufacturing that employs computer integration high levels of adaptability and rapid design changes together with digital information technology and a technically trained workforce This book presents the proceedings of SMMP2022 the 2022 International Conference on Smart Manufacturing and Material Processing held on 12 and 13 August 2022 as a virtual event due to continuing restrictions related to the COVID 19 pandemic and hosted from Shanghai China The conference provides a

platform for researchers and scientists from smart manufacturing and material sciences to come together with researchers from various other application areas to discuss problems and solutions identify new issues and shape future directions for research The conference received 60 submissions These were submitted to a rigorous peer review process by a committee of experts from various disciplines after which 23 were accepted for presentation at the conference and publication here The topics covered include materials processing and product manufacture sensors and smart material systems functional materials industrial automation and process control and discussion of the state of the art and future direction of smart manufacturing and material sciences Providing an overview of current developments in smart manufacturing and material processing the book will be of interest to all those working in the field *Proceedings of Mechanical Engineering Research Day 2020* Mohd Fadzli Bin Abdollah,Hilmi Amiruddin,Amrik Singh Phuman Singh,2020-12-01 This e book is a compilation of 170 articles presented at the 7th Mechanical Engineering Research Day MERD 20 Kampus Teknologi UTeM virtual Melaka Malaysia on 16 December 2020 **Advances in Engineering Research and Application** Duy Cuong Nguyen,Ngoc Pi Vu,Banh Tien Long,Horst Puta,Kai-Uwe Sattler,2022-12-01 The International Conference on Engineering Research and Applications ICERA 2022 held on December 1 2 2022 at Thai Nguyen University of Technology in Thai Nguyen Vietnam provided an international forum to disseminate information on latest theories and practices in engineering research and applications The conference focused on original research work in areas including mechanical engineering materials and mechanics of materials mechatronics and micro mechatronics automotive engineering electrical and electronics engineering information and communication technology By disseminating the latest advances in the field the Proceedings of ICERA 2022 **Advances in Engineering Research and Application** assists academics and professionals alike to reshape their thinking on sustainable development **Advances in Engineering Research and Application** Kai-Uwe Sattler,Duy Cuong Nguyen,Ngoc Pi Vu,Banh Tien Long,Horst Puta,2020-11-23 This proceedings book features volumes gathered selected contributions from the International Conference on Engineering Research and Applications ICERA 2020 organized at Thai Nguyen University of Technology on December 1 2 2020 The conference focused on the original researches in a broad range of areas such as Mechanical Engineering Materials and Mechanics of Materials Mechatronics and Micromechatronics Automotive Engineering Electrical and Electronics Engineering and Information and Communication Technology Therefore the book provides the research community with authoritative reports on developments in the most exciting areas in these fields

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

Conference on Mechatronics and Automation Technology held as a virtual event on 27 October 2023 The aim of the conference was to provide a platform for scientists scholars engineers and researchers from universities and scientific institutes around the world to share the latest research achievements in mechatronics and automation technology explore key challenges and research directions and promote the development and application of theory and technology in this field A total of 121 submissions were received for the conference of which 77 were ultimately accepted after a rigorous peer review process The papers cover a wide range of topics falling within the scope of mechatronics and automation technology including smart manufacturing digital manufacturing additive manufacturing robotics sensors control electronic and electrical engineering intelligent systems and automation technology as well as other related fields Providing an overview of recent developments in mechatronics and automation technology the book will be of interest to all those working in the field

Manufacturing Facilities Dileep R. Sule,2008-12-22 Fierce global competition in manufacturing has made proficient facilities planning a mandatory issue in industrial engineering and technology From plant layout and materials handling to quality function deployment and design considerations Manufacturing Facilities Location Planning and Design Third Edition covers a wide range of topics crucial to the success of manufacturing operations

Energy And Mechanical Engineering - Proceedings Of 2015 International Conference Steven Y Liang,2016-03-03 The International Conference on Energy and Mechanical Engineering brought together scientists and engineers from energy and engineering sectors to share and compare notes on the latest development in energy science automation control and mechanical engineering This proceedings compiled and selected 156 articles organized into Energy Science and Technology Mechanical Engineering Automation and Control Engineering Amongst them are the results and development of Government sponsored research projects undertaken both in universities research institutes and across industry reflecting the state of art technological know how of Chinese scientists

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

2022 2nd International Conference on Information Control and Automation ICICA 2022 was held on December 2nd 4th 2022 in Chongqing China virtual event Invited and contributed papers present the state of the art research in information control and automation This workshop always welcomes a fruitful mix of experienced researchers and students to allow a better understanding of related fields The 2022 session of the information control and automation was doubtlessly a great success The program covered a wide variety of topics namely Numerical Analysis Information Theory Genetic Algorithm Distributed Control System Industrial Control Motors and Appliances etc The conference agenda was divided into two parts including Keynote Speeches and Oral Presentations ICICA 2022 is to bring together innovative academics and industrial experts in the field of Information Control and Automation to a common forum The primary goal of the conference is to promote research and developmental activities in Information Control and Automation and another goal is to promote scientific information interchange between researchers developers engineers students and practitioners working all around the world The conference will be held every year to make it an ideal platform for people to share views and experiences in Information Control and Automation and related areas Everyone interested in these fields were welcomed to join the online conference and to give comments and raise questions to the speeches and presentations

Mechanical Equipment Mechanism Design Hao Zhang,Adrian David Cheok,Yujun Zhang,Tianyong Zhang,2025-08-12 In recent years many new products have emerged in machinery and electronics necessitating innovative designs As a result the mechanism designs of mechanical equipment are facing greater challenges The mechanical mechanism is a crucial component of machines An ideal mechanism design plays a pivotal role in the development of new products Using their vast experience in technical designs the authors have compiled a collection of 100 design cases in this volume The volume aims at assisting technicians engaged in mechanism design and innovation in developing their own unique design concepts and becoming more proficient in the innovative design of mechanisms The cases presented in this book are all drawn from practical production experiences and each case study clearly outlines the details of the mechanism in question While they may not be optimally designed all achieve their intended functions

Mines and Mining Equipment and Service Companies Worldwide ,1986 *Climate Protection, Resource Efficiency, and Sustainable Engineering* Ilona Horwath,Swetlana Schweizer,2023-08-04 The big societal challenges such as climate change and public health call for innovative approaches to address them The contributors of this book present new ways to tackle these challenges by inter and transdisciplinary collaborations in light weight engineering They introduce a framework for transdisciplinary collaboration explore the potential of light weight engineering in the areas of climate protection resource efficiency and sustainable mobility To do so they exemplify results and limitations of transdisciplinary collaboration based on three case studies the optimization of rescue tools the re design of products to foster re use and recycling processes in companies and society and the additive manufacturing of individualized assistive tools and prostheses

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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