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“A REVIEW ON HYDRAULIC SCISSOR LIFT”

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ABSTRACT

This Paper depicts the plan as well as investigation of a water powered scissor lift. Traditionally a scissor lift or jack is utilized for lifting a vehicle to change a tire, to get to go to the underside of the vehicle, to lift the body to calculable level, and numerous different applications Also such lifts can be utilized for different purposes like upkeep and numerous material taking care of tasks. It tends to be of mechanical, pneumatic or pressure driven type. This paper is principally centered around force following up on the water driven scissor lift when it is expanded and contracted. By and large, a water driven scissor lift is utilized for lifting and holding significant burden parts. Material determination assumes a vital part in planning a machine and furthermore impact on a few variable, for example, sturdiness, dependability, strength, obstruction which at long last prompts increment the existence of scissor lift.

Key Words: Hydraulic scissor lift, solid works ,Car lift, strength, material.

I. INTRODUCTION

A scissor lift or system is a gadget used to broaden or situate a stage by mechanical means. The expression "scissor" comes from the repairman which has collapsing upholds in befuddle "X" design. The expansion or relocation movement is accomplished by the utilization of power to at least one upholds, bringing about an extension of the cross example. The power applied to broaden the scissors instrument may by pressure driven, pneumatic or mechanical (by means of a lead screw or rack and pinion framework).The requirement for the utilization of lift is extremely fundamental and it stumbles into labs, studios, manufacturing plants, private/business structures to fix streetlamps, fixing of announcements, electric bulbs and so on extended and less-productive, the architects might run into at least one issues when being used.The name scissors lift began from the capacity of the gadget to open (grow) and close (contract) very much like a scissors. Taking into account the requirement for this sort of component, assessing also the expense of extending energy more that outcome gotten too the upkeep and so on embracing this plan idea to the development of the machine is better.

The underlying thought of configuration considered was the plan of a solitary pressure driven slam for substantial vehicles and putting it under, however this has impediments with respect to the level and steadiness, and somebody will be underneath controlling it. It was somewhat figured out that; there is plausible of the singular climbing/dropping, to be controlling the gadget himself. Accordingly further exploration was made to perceive how to accomplish this point.Before this time scissors lift existing utilize mechanical or pressure driven framework fueled by batteries for its tasks. A few difficulties were experienced in this very plan. Some among many incorporate; low productivity, chance of having the batteries released during a crisis, broadened season of activity, subordinate activity, as well as upkeep cost. The thought of these elements started creating this using pressurized water controlled scissors lift with free administrator. The thought is equipped towards delivering a scissors lift utilizing one pressure driven slam put across,

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in the middle of between two cross edges and controlled by a siphon associated with an engine wheel might be fueled by a siphon generator. Likewise, the singular rising/diving is as yet unchanged individual controlling it. For example the control station will be situated on the top casing. A scissors lift is joined to a piece of hardware having a work station known as scissors lift table that houses the siphon, the repository, the generator, control valves and associations and the engine. A scissors lift doesn't go as high as a blast lift; it penances levels for a huge work station. Where more level is required, a blast lift can be utilized.

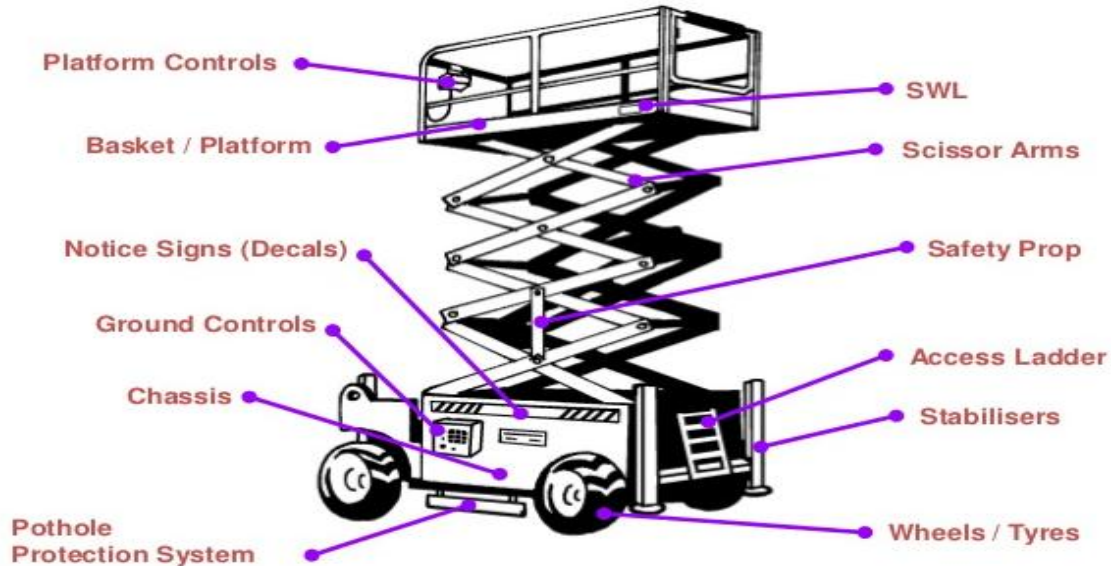


Fig. 1.1 Scissor lift

1.1 SCAFFOLD

Framework permits laborers to ship themselves and their materials to raised levels, normally out of control in an incomplete structure. Frameworks are intended to permit laborers get to raised levels; they are utilized in building locales and building destinations however utilized basically in building destinations. As per Google web search machine, framework is cross part of lines, irons or woods which are organized so that specialists or administrators can get on the organized lines to get to raised levels.

Platforms can't be changed naturally and they just can stay fixed how it is organized except if reworked. The cylinders are either steel or aluminum, albeit composite framework utilizing fiber twisted containers of glass fiber in a nylon or polyester grid. On the off chance that steel, they are by the same token "dark" or aroused. The cylinders arrive in an assortment of length and a standard measurement of 48.3mm. The essential contrast between the two kinds of cylinders is the lower weight of aluminum tubes (1.7kg/m rather than 4.4kg/m) and furthermore a more prominent adaptability thus less protection from force. Tubes are by and large purchased in 6.3m length and can be chopped down to specific commonplace sizes.

Sheets give a functioning surface to clients of the framework. They are prepared wood and are serious areas of strength for extremely. Frameworks for expanded level are ideally made of solidified materials like metal lines. Subsequent to organizing the lines, a level materials normally made of wood is put on top so the specialist can stand agreeable on top. [<http://en.m.wikipedia.org/wiki/scaffold>]

1.2 BOOM LIFT

Blast lifts are utilized for lifting materials particularly on building destinations, they are intended to convey weighty hardware and materials starting with one spot then onto the next. They are generally associated with vehicles or trucks that move starting with one spot then onto the next.

Blast lifts can lift materials and gear high to level so incredible that conveying this hardware by different means will nearly be unthinkable.

As per material dealing with hardware from ask web crawler, Boom lifts can move upward, on a level plane and

sideways and some could pivot relying upon the situation. Blast lifts are extremely perplexing iron plan and the jointed parts ought to be greased up to decrease grinding and further develop effectiveness. Blast lifts are shaped mostly in building destinations and building locales. They are additionally used by Electrical organizations and firms like PHCN (Power Holding Company of Nigeria) Plc. They are over the top expensive and are not accessible in unrefined or semi automated sort of creation. Blast lift have advantage over different kinds of lifts since it can lift weighty materials, save them at raised levels for a significant stretch of time; turn and the lift range of the gear is long. Blast lift can crease together to become packed and compact.

There are two fundamental kinds of blast lifts: straight blast lift and explained blast lift. These units are frequently using pressurized water fuelled.

1.3 THE STRAIGHT BOOM LIFTS

Straight blast lifts are for the most part utilized for occupations that expected a high reach without hindrance. The machines turntable can pivot 360o with an extensible blast that can be raised upward to underneath evenly. The administrator can move and direct the vehicle while the blast is completely broadened. It is accessible in gas, propane or diesel-controlled models with two or four wheel drive.

1.3.2 ARTICULATED BOOM LIFT:

Verbalized blast lifts are utilized for occupations that require arriving at over-top deterrents to get to a task not effectively accomplished by a straight adaptive blast. This lift is almost indistinguishable from the straight blast lift in each perspective; besides in the blast's capacity to verbalize. Explanation focuses on the blast permit it to twist in quite a few distinct bearings empowering it to move around different obstructions on a place of work.

Blast lifts can be furnished with out riggers to settle the unit while the blast is completely expanded. [http://ritchienikit.com/wiki/index.php/elevated platform]

1.4 MECHANICAL SCISSORS LIFT

The mechanical scissors lift is utilized for lifting materials particularly on building locales. This is one of the latest progression on scissors lift. There, the lift uses a belt drive framework associated with a heap screw which develops the "X" design on fixing and extends it on slackening. The lead screw really accomplishes the work, since the applied power from the wheel is switched over completely to straight movement of the lift by help of the lead screw. This can be utilized to lift the working and hardware to a level.

An overall information be that as it may, with respect to screws will uncover the misfortune because of erosion in the screw dangers. Thusly, the productivity of this gadget is low because of misfortunes in grinding. Likewise, the power expected to drive the machine is manual, and much energy is extended to accomplish an ideal outcome. Its appropriateness be that as it may, can't be overemphasized as it tends to be utilized in pretty much all aspects of the country regardless of whether there is accessibility of power.



Fig.1.2 Scissor lift

1.5 HYDRAULIC LIFT:

Pressure driven lift is a gadget for conveying people and loads starting with one story then onto the next, in a multi-story building. The water powered lifts are of the accompanying sorts.

1. Direct acting pressure driven lift and
2. Suspended pressure driven lift.

The immediate acting pressure driven lift comprise of a slam sliding in a chamber. A stage or an enclosure is fitted to the top finish of slam on which merchandise might be set or the people might stand. As the fluid under tension is owned up to the chamber, the smash goes up and the enclosure is lifted. The lift of the enclosure is equivalent to the stroke of the slam. The enclosure moves in the descending bearing when the fluid from the proper chamber is eliminated.

The suspended pressure driven lift is a changed type of the immediate acting water powered lift. It is fitted with a jigger which is precisely, same as on account of a water powered crane. The enclosure is suspended by ropes. It runs between guides of hard wood round steel. To adjust the heaviness of the enclosure sliding equilibrium loads are given. [Gupta, 2006]



Fig.1.3 bike mounted scissor lift

1.5.1 HYDRAULIC SCISSORS LIFT

Scissors lifts has grown extra time, and at each phase of its turn of events, basic issues are addressed.

The water driven type, yet this time, the heap screw is supplanted by a water powered smash fueled by a siphon and on electric engine and generator. One extraordinary component about this plan notwithstanding. Is its autonomous activity and expanded productivity. Liquid power is one of the more prominent type of force where little info brings about an extremely huge result. This scissors lift can be dealt with by one individual to a position of purpose, and power the generator. The lift doesn't lifting right away, the administrators hops on the stage and switches open the pressure driven circuit accordingly prompting a vertical augmentation. At the point when the expected level is arrived at the circuit is shut, and lifting stops the control board or station is situated on the top casing. At the point when work is finished, the scissors lift is collapsed by water powered implies and dealt with back to the place of assortment.

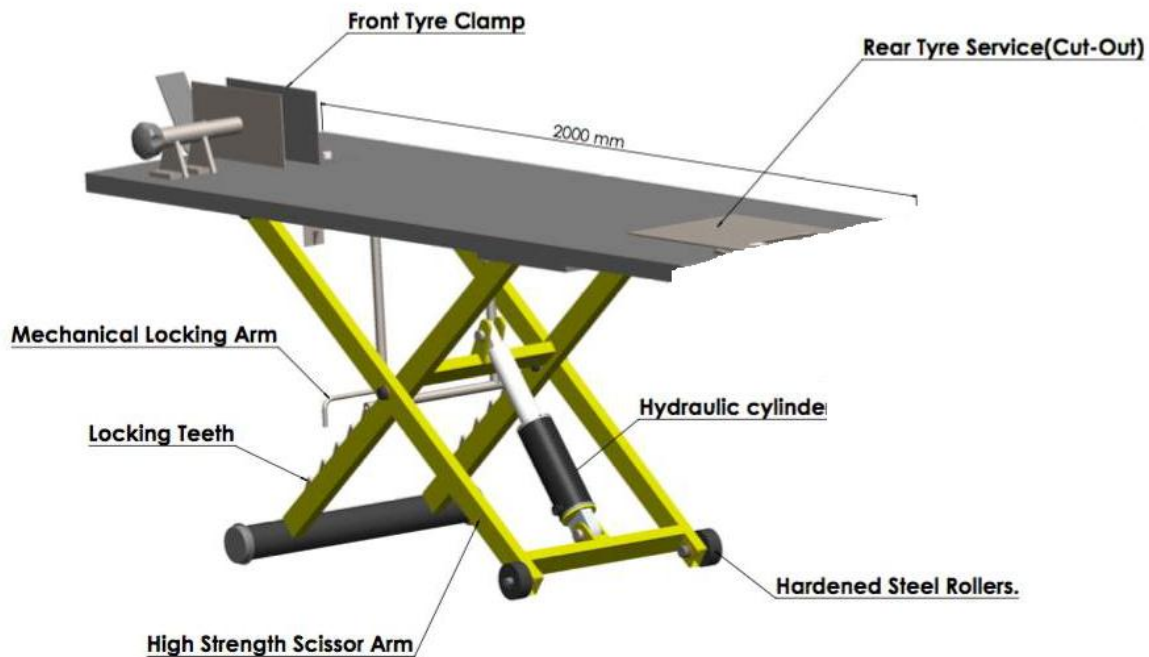


Fig.1.4 Hydraulic Scissors Lift

II. LITERATURE REVIEW

Monitors mission for development has never been fulfilled. The drive towards better and more noteworthy logical and mechanical result has made the world dynamic. Before now, a few researcher and designers have done a ton of work as respects the scissors lift overall. A survey of a portion of that work gives the plan and development of a pressure driven scissors lift a stage.

Gaffar G Momin, et al [2015] This Paper depicts the plan as well as investigation of a water powered scissor lift. Traditionally a scissor lift or jack is utilized for lifting a vehicle to change a tire, to get to go to the underside of the vehicle, to lift the body to calculable level, and numerous different applications Also such lifts can be utilized for different purposes like upkeep and numerous material taking care of tasks. It tends to be of mechanical, pneumatic or pressure driven type. The plan portrayed in the paper is created remembering that the lift can be worked by mechanical means by utilizing pantograph so the general expense of the scissor lift is diminished. For our situation our lift was required to have been planned a versatile and furthermore work without consuming any electric power so we chose to utilize a water driven hand siphon to control the chamber Also such plan can make the lift more smaller and much reasonable for medium scale work. At last the examination of the scissor lift was finished in ansys and all capable boundaries were broke down to check the similarity of the plan values.[1]

Divyesh Prafulla Ubale, et al.[2015] The regular strategy for utilizing rope, stepping stool lift getting individual to a level experience a ton of limit (significant investment utilization, ease, measure of burden that can be conveyed and so on) likewise there might be a gamble of tumbling down in the event of stepping stools thus water driven scissors lift is intended to conquer this large number of hardships. The primary point of this paper is plan and investigation and to build a multiutility home hardware for senior residents with the goal that they can convey their day to day exercises productively. Additionally the hardware ought to be reduced and practical. Lifting level accomplished by scissor component is of 1 m from base level. Clasp and twisting disappointment examination of scissor is additionally finished in this paper. With unending advancement of science and innovation, an ever increasing number of new advances are applied to lifting machine plan. This undertaking targets making hardware multifunctional, simple to utilize/work, financially savvy and compact with the goal that it will be utilized helpfully at home and might be utilized in emergency clinics, lodgings and other normal spots. Senior residents deal with numerous issues to do their everyday exercises, as this hardware is planned so that (for example it is remote worked with battery) they can undoubtedly move

in house and perform everyday exercises. All security contemplations are considered while planning hardware. Scissor lifting instrument is intended to lift individual to wanted level. A scissor lift instrument is a gadget used to expand or withdraw a stage by water powered implies. The Extension or dislodging movement is accomplished by the utilization of power by pressure driven chamber to at least one upholds. This power brings about a lengthening of the cross example. Withdrawal through pressure driven chamber is likewise accomplished while bringing down of stage is wanted.[2]

Setu Dabhi, et al,[2015] This paper depicts the plan and examination of water driven bed framework in a chain transport utilized in car ventures for stacking and dumping of materials .The framework, comprising of a water driven power pack, a chain transport, a bed framework is consequently controlled with the assistance of PLC. Our point is to plan a practical and a financially savvy instrument to lift the given burden utilizing pressure driven incitation and posting benefits of water powered incitations over pneumatic and servo activation. The plan module bed alongside system utilized for adjusting is plan in CAD programming CATIA and examined for variable stacking in ANSYS .The plan proposed is exceptionally adaptable with the fabricates prerequisite and its dependability is dissected under factor load. The consequence of the practicality study showed a prominent shortening of working hours, and a mitigation of physical work The producer required a bed framework which is to be water powered incited, as opposed to pneumatically or servo impelled. Looking at the three frameworks, we track down pneumatic framework fairly beneficial over the other two. Benefits of pneumatic framework are recorded underneath: Simplicity in plan, Cost compelling, Safety and dependability disregarding the above benefits, it was found that water powered framework could deal with more burden when contrasted with the past, and the back pressure so created in water driven activation could effectively be taken care of when contrasted with pneumatic during development of the bed ,so as keeping up with strength and decreasing how much vibrations. Taking into account the inclusion of the third framework , where incitation of the bed is by means of servo engines is out of inquiry ,as its exceptionally exorbitant, requires regular upkeep, and its heap bearing limit is likewise low when contrasted with others. The primary benefit of involving pressure driven framework in our application over pneumatic other than the heap bearing limit is the liquid in water powered framework is fundamentally incompressible, consequently it prompts least springing activity. So regardless of whether the heap on the bed is non uniform, the actuators will adjust the bed in such a manner in order to limit the possibilities of over tossing the heap. This kind of wellbeing measure is challenging to accomplish utilizing pneumatic activation, and, surprisingly, in the event of uniform stacking the vibration experienced is considerably more.[3]

S. B. Naik, et al [2015] An extraordinary kind of bar lifting gadget is intended for material businesses. The machine is using pressurized water worked and is having two casings one flat and another vertical. Even edge is mounted with two adjustable chambers utilized for shaft lifting to required level. The portability for the design is given by utilizing castor wheels. Limited component examination of the edges is finished by ANSYS programming considering the need of the material businesses, a specific reason machine has been intended to lift the pillars in material ventures. The limited component examination of the edge of this machine is finished to find out about the anxieties and distortion of the construction to change something similar if necessary.[4]

M. Abhinay, P.Sampath Rao et al [2014] Airborne scissor lifts are for the most part utilized for impermanent, adaptable access purposes, for example, support and development work or by firemen for crisis access, and so on which separates them from extremely durable access gear like lifts. They are intended to lift restricted loads typically under a ton, albeit some have a higher safe working burden (SWL). The rising interest of Aerial Scissor Lifts in organizations to further develop their assembling adaptability and result by giving.[5]

M. Kiran Kumar et al [2016] This paper is principally centered around force following up on the water driven scissor lift when it is expanded and contracted. By and large, a water driven scissor lift is utilized for lifting and holding significant burden parts. Material determination assumes a vital part in planning a machine and furthermore impact on a few variable, for example, sturdiness, dependability, strength, obstruction which at long last prompts increment the existence of scissor lift. The plan is performed by considering water powered scissor lift as a versatile, reduced and much reasonable for medium sort of burden application. Drafting and drawing of water driven framework scissor lift is finished utilizing strong works with appropriate demonstrating and imported to Ansys work seat for cross section and examination. Subsequently, the examination of the scissor lift incorporates Total deformity load, Equivalent pressure,

was finished in Ansys and all capable boundaries were broke down to check the similarity of the plan esteem. The computational upsides of two distinct materials, for example, aluminum and gentle steel are thought about for best outcomes.[6]

Anh-Tuan Dang et al [2021] Scissor lifts are applied for moving or lifting different items. Water driven chambers are utilized to raise or lower stages which have numerous ways of organizing. This study means to decide proper aspects in plan 1X water powered scissor lifts. Utilizing representative factors to control the aspects, places of the chamber are determined to guarantee the viability of working space and powers in the chambers. Results got from the estimations demonstrate the act of mathematical techniques and can be utilized to decide ideal aspects for plan 1X scissor lifts. Scissor lifts are applied for moving or lifting different articles.[7]

III. PROBLEM STATEMENT

An issue stays an issue until an answer is proffered. With the constraints experienced in the utilization of ropes, stepping stools, platform and mechanical scissors lifts in getting to raised level, for example, how much burden to be conveyed, comparability, time utilization, much energy consumed and so on the possibility of a powerfully controlled scissors lift which will defeat the above expressed restrictions is utilized.

IV. IMPORTANCE/SIGNIFICANCE OF THE STUDY

The plan and development of a water driven scissors lift is to lift a specialist along with the functioning gear serenely and securely to a necessary working level not effectively open. It could be utilized without a fundamental outer help or help from a second party because of the idea of the plan. This undertaking will be a significant designing apparatus or gadget utilized in upkeep occupations. Changing of streetlamps, painting of high structures and dividers around the school climate.

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