

Fabrication of Emergency Car Towing Machine

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ABSTRACT: Due to mechanical failure automobiles get stuck at the mid path of their journey. So there is a need to design and develop a system which can sideline the failed automobile. The main aim of our project is to design and develop car towing machine which is helpful to move the car from one place to another place. The main components used in the system are Screw jack, Wiper motor. The 3D model will be drawn with the help of CATIA V5 R20 software and accordingly calculations are done. After that the components which are required for our project are manufactured and then assembled together. After making the assembly, the testing of model will be carried out. The result and conclusion will be drawn after the testing of the model.

KEYWORDS: Car Towing, 3D model, CATIA V5 R20.

I. INTRODUCTION

Towing is coupling two or additional objects along so they will be force bay selected power supply or sources. The towing supply perhaps a motorized land vehicle, vessel, animal, or human, the load something that may be force. These is also joined by a series, rope, bar, hitch, three-point, fifth wheel, coupling, drawbar, integrated platform, or alternative means that of keeping the objects along whereas in motion. Towing is also as straightforward as a tractor pull a plant part. The foremost acquainted kind is that the transport of disabled or otherwise indisposed vehicles by a motortruck or "wrecker."Alternative acquainted forms area unit the tractor-trailer combination, and loading or leisure vehicles coupled via ball or pivot and gudgeon trailer-hitches to smaller trucks and cars. Within the opposite extreme area unit extraordinarily serious duty tank recovery vehicles, and large ballast tractors concerned in serious shipping towing loads stretching into the variant pounds.

Necessarily, government and business standards are developed for automobiles, lighting, and coupling to make sure safety and ability of towing instrumentation. Traditionally, barges were hauled on rivers or canals victimisation tow ropes drawn by men or draught animals walking on towpaths on the banks. Later came chain boats. Today, tug boats area unit wont to makeover larger vessels and barges. Over thousands of years the maritime business has refined towing to a science. craft tow one-another also. Troop and loading automobile gliders area unit towed behind high-powered craft, that remains a well-liked means that of obtaining fashionable leisure gliders aloft. There area unit several safety issues to properly towing a caravan or trailer / travel trailer beginning with vehicle towing capability and move through equalizer hitches to properly and de jure connecting the protection chains.

II. RELATED WORK

The idea of picture inpainting was first presented by Balkeshwar Singh et al. [1]. With the expanding levels of innovation, the endeavors being put to deliver any sort of work has been ceaselessly diminishing. The endeavors required in accomplishing the ideal yield can be Effectively and monetarily be diminished by the usage of better structures. Force screws are utilized to change over turning movement into interpreter movement. A screw jack is a case of a force screw in which a little power applied in a flat plane is utilized to raise or lower a huge burden. The guideline on which it works is like that of a slanted plane. The mechanical bit of leeway of a screw jack is the proportion of the heap applied to the exertion applied. The screw jack is worked by turning a lead screw. Jakub Polasik et al. [2] The body while the vehicle is moving is tilts the longitudinal and transverse bearings. Transverse created for the most part by unevenroad surface and longitudinal driving procedures (quickenning and slowing down). Expanding the heaviness of the vehicle shipped load upgrades tilt. During freight conveyance vehicles are

required to be sufficiently secured and the appropriation of the heap region so as to limit hazardous tilt. Inaccurately made sure about burden during substantial slowing down can move and change drive direction of the vehicle and expand the slowing down separations. The consequences of street tests change the tendency of vehicle body of the vehicle a towing vehicle moving vehicles of various mass. The point of research was the estimation of edge of longitudinal tilts of a conveyance truck with an uncommon lodging for transport of vehicles. The tests comprised of escalated increasing speed of the towing vehicle from start to the normal speed and next concentrated slowing down until full stop. Mithil.R et al. [3], The task work titled "Electro Hydraulic Jack" has been imagined having considered the trouble in lifting any kind of vehicles. Our review in regards to a few car carports, uncovered the realities that for the most part some troublesome strategies were received in lifting the vehicles for reconditioning. The undertaking has basically focused on this trouble. In this venture we are changing over the customary water powered jack in to mechanized pressure driven jack by utilizing linkage component with an assistance of an engine. To such an extent that the vehicles can be lifted from the floor land without the use of effect power. It chips away at the standard of Pascal law the creation identifies with pressure driven jack and all the more explicitly to a car water powered jack framework. C.L. Petracconi et al. [4], An examination between lab test information on weariness break nucleation in a back tow snare pin get together of traveler vehicle and a computational system utilizing business bundle programming is introduced. Exhaustion harm is resolved utilizing nearby material reaction, estimated during test tests. Trials were performed mimicking the real conditions in the client condition. Anxiety were tentatively estimated by utilizing strain gages, reinforced on the snare gathering. These trial lives are contrasted and those acquired through numerical investigation utilizing a business weakness programming. Weakness investigation techniques (S–N bends, downpour stream tallying and Miner rule) were utilized to decide the exhaustion harm forced on the segment. Understanding and assessment of the deliberate strain and stresses, recreation tests and weakness life appraisals, based on S–N bend, are depicted in this paper

III. METHODOLOGY

We started our work with literature survey. Search many research papers from various articles and published journal papers. Then we collected all the topic related data from these research papers and studied them in detailed manner along with the standard reference books and academic books. Worked on diff. mechanisms that can be useful for our project. We have done a rough 2D sketch of model in Auto-CAD. After the final analysis and material selection we go out in the market to purchase the required components with required specifications. This purchasing process we approximately estimated the cost required to purchase the components and for machining. We selected standard components. Finally, our product will be manufactured in second semester and results and testing will be carried out.

Fig shows the manufacturing operations of an model Figs. 1 (a) shows cutting. (b) welding of material. (c) drilling of plate. (d) polishing for smooth and shiny surface.



(a)



(b)



(c)



(d)

Fig. 1 Maching operations (a) cutting (b)welding (c) Drilling (d) Polishing

IV. EXPERIMENTAL RESULTS

Figures shows the Cad model and drafting of car towing machine Figs. 2 (a) shows the Cad image. (b) is the image obtained by applying drafting command on Catia model

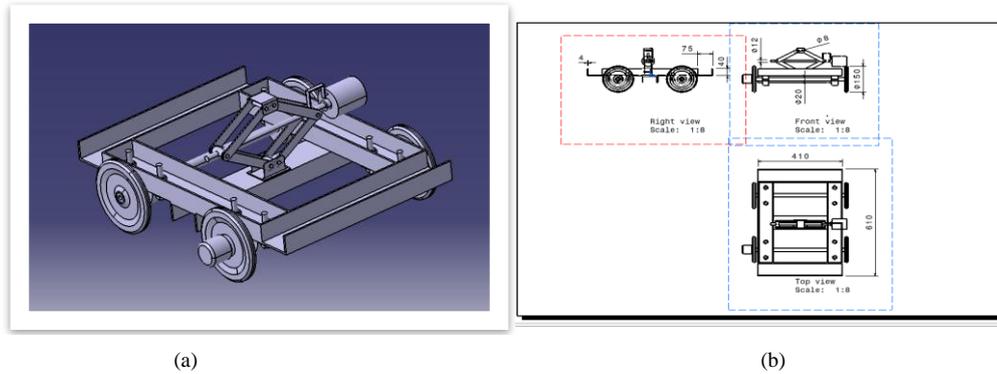


Fig. 2. car towing Machine (a) CAD Model (b) Drafting of CAD Model

2.Components Used

A. WIPER MOTOR

The wiper motor rotates endlessly in one direction that is reborn into a back and forth motion. Its composition entails heaps of mechanical linkages every taking part in a task in initiating the movement. The gear head motor is that the style of electric motor famous for its abundance in force. So as for the electric motor to maneuver it wants an influence supply. The various power sources ar the automobile batteries, voltages (12volts DC), current (minimum of 1.6 amps at 70 rpm; 1 amps at 41 rpm), dc batteries (12volts output) and alternative battery provides that doesn't exceed the limit of 12 volts otherwise the motor is guaranteed to overheat. Another factor to think about within the configuration of a electric motor is that the wiring and electrical terminals. These wirings electrical terminal have the aim of organizing the configurations for electric motor speed or mode. The amount of electrical terminals will vary from 5 to 12 slots for low speeds, moderate speeds, high speed, terribly high speed, manual perform, off mode, common terminal and also the park switch.

B. SCREW JACK

A screw jack consists of a heavy vertical screw with a load table mounted on its high, that screws into a rib hole during a stationary support frame with a large base resting on the bottom. A rotating collar on the pinnacle of the screw has holes into that the handle, a block, fits. Once the handle is turned right-handed, the screw moves more out of the bottom, lifting the load resting on the load table. So as to support giant load forces, the screw typically has either sq. threads or butress threads.

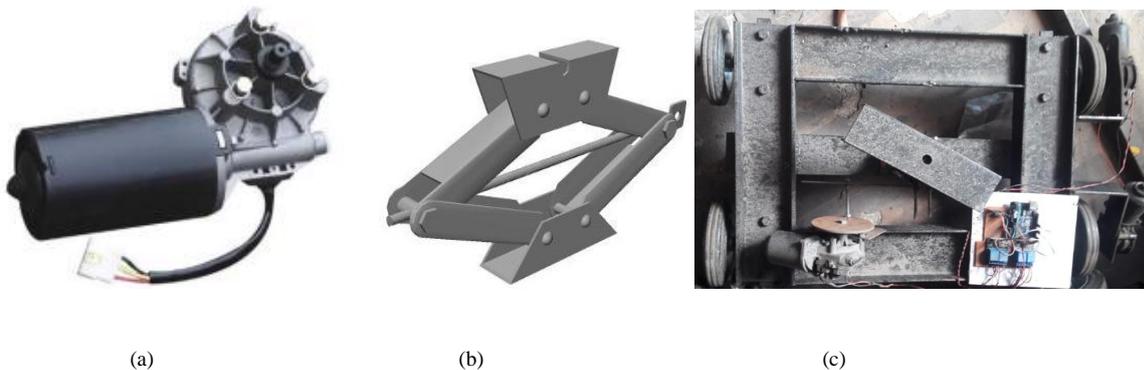


Fig. 3. Components used(a) Wiper Motor (b) Screw Jack (c) car towing machine model

V. WORKING METHODOLOGY

In our design two motors are used, one is for moving the damaged automobile and another is for screw jack. Our system is designed in such a manner so that it has low height, hence it can move below any of the car. The upper face of jack is placed in such a manner so that it gets stuck into the C-Section of the car. Now a motor is used to rotate lead screw and that jack will move in upward direction. It is placed at the front side of the car and when condition of gear is neutral. So it will lift the car using high torque supplying DC Wiper motor. Now the other motor used to move the vehicle is made to work so that it will move the vehicle. All the controlling is made by Bluetooth controller. Finally the vehicle is side lined and vehicle comes to its zero position.

VI. CONCLUSION

As we manufacturing of towing machine for four wheelers towing we can reduce man effort. Here we fabricated a car towing machine which is operated using a DC wiper motor which gets dc supply from the battery of the vehicle without application of man force. It can help in all breaks down condition especially for the female and elder people.

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