

Hydraulic Hand Fork.

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Abstract: *The main goal of hydraulic hand forklift is to rotate in 360 degree. It will be used in home appliances in malls normal hand pallet handle move in 180 degree but in this we can rotate 360 degree because of it it become easy to carry things on it. the aim of this project is to move hand pallet easily in short radius and we have additionally put a hydraulic in it so it will have more weight bearing capacity and we can move pallet up & down .*

Keywords: Hydraulic Hand, Forklift, Pallet

I. INTRODUCTION

It is a hydraulic hand fork lift it comes under material handling it is used in small scale industries, malls and many more. it is the new concept of hand pallet earlier we used normal hand pallet which was very basic having plates to keep object and a handle to pull it and a small hydraulic system we have taken idea of this from old hand pallet and automated hand pallet used in big industries, We have made better version of hand pallet called hydraulic hand fork lift. We have made it in such a way that the plates of hand fork can move upward and downward to load & unload the objects. We have made in such a way that it can be modified easily without breaking it. The construction of this is very easy anyone can make it. the main thing is it is cost effective so small scale industries can afford to buy it. Maintenance of hand fork is not costly is we use it carefully. If we not use it carefully there are chances of leakage in hydraulic and some frame problem if we put load more than the capacity of hand fork. Hydraulic hand fork lift is future proof. If the customer want more add on in the hand fork it can be done.

Like electric motor to move plates upward & download with the help of switches. We can pneumatic for better movement of plates. We can add better wheels as per need. Below are the list of components used in hydraulic hand fork.

II. LITERATURE SURVEY

[A] A. Ehlanda, M.S. Williams, A. Blakeborough commented Long-span warehouse floors can suffer problematic vibrations due to dynamic interaction with moving fork-lift trucks. However, the dynamic loads caused by trucks are poorly understood and no mathematical model of these loads suitable for use in a dynamic analysis has previously been proposed. This paper presents a two-degree-of-freedom dynamic load model of a fork-lift truck suitable for use in an analytical floor vibration assessment. The load model comprises two time-varying vertical forces that are a fixed distance apart. Each force is the product of a mass matrix and a vertical acceleration vector, which is in turn a function of the horizontal velocity of the truck. The model derivation is partly analytical and partly experimental, with some key parameters derived from field tests on four fork-lift trucks in a total of twelve configurations. Data for general models are presented for a range of truck capacities from 1000 kg to 6000 kg. The model fills a significant gap in the current state of the art of vibration analysis, enabling a realistic assessment of fork-lift truckinduced floor vibrations to be performed using a finite-element program.

[B] J. Malchaire, A. Piette and I. Mullier investigates the effects of the main characteristics of the working condition on the vibration exposure on fork-lift trucks. Four hundred and eighty recordings were made on five trucks equipped with four different types of tyres and a 'normal' or an 'anti-vibration' seat, driven while empty or loaded, on a smooth or a rough track by three workers. An analysis of variance was performed to study the main effects and the significant interactions between these factors. A mathematical model is proposed for the eighted acceleration on the floor and on the seat in the vertical axis. This shows quantitatively that the vibration exposure is mainly influenced by the roughness of

the track, the speed and the quality of the seat. Inflated tyres are preferable when an anti-vibration seat with a very low resonance frequency is used. In other cases, cushion tyres are more indicated

[C] Lili Wanga et al. In recent years, the forklift is facing two challenges energy saving and environmental. However, the hydraulic forklift has low transmission efficiency and energy efficiency. To solve the problem, this paper proposes an approach for the lifting hydraulic cylinder replaced by ball screw device. The lifting system is controlled directly with an electric motor drive instead of pump. First, we analyzed the working condition and energy flows of the forklift and proposed an energy recovery system for forklift. Second, we built the system model including super capacitor model, vehicle model and the simulation model in AMESIM. Due to the markedly changing loads, super capacitor with high specific power and high durability seems the best choice for energy storage system. In addition, the study of rule-based energy management control strategies on forklift with electric lifting device is discussed, which is validated and evaluated by simulation. The results show that the fuel consumption of the forklift with electric lifting device can be reduced by about 46.72% compared with the hydraulic forklift and its transmission efficiency is improved 82.3% when the loads is 3t. The energy saving effect of electric system is very significant.

1st Component We have used nylon wheels – This nylon wheels have good resistant to a wide range of aggressive substances, and has good rolling properties on smooth floors & is available in a variety of versions. We have used 2 types of wheels in this one is rolling wheels & second is 360 degree rotating wheels which are lockable so on slope it will not slip.



Temporary we have used this wheels but in future we can install better wheels of same size or can install bigger wheels. This wheels are commonly used everywhere so we used it and this wheels can last for long time it will depend how we use it.

2nd Component We have used RHS-for making body of hydraulic hand fork lift (rectangular hollow section) . We have use it because of its smooth flat surface. This material is best for frame work. RHS is made up of stainless steel. This material is corrosion resistant, high durability, it has high tensile strength and this material can be recycle so it is environment friendly. Due to the rectangular shape of this type of hollow section, when joining to other flat surfaces sections only need to be conventional cut. RHS requires negligible edge preparation for welding or joining. This material is easily available in market. We have coated frame with oil paint & anti rust powder coating.



3rd Component we have used is nut & bolts - This is one of the main component used in this and is used in every machinery which does heavy works. Nuts & Bolts are Fasteners.

Mainly 3 types of Nut & Bolts used in make a hydraulic hand fork lift.

1st BF25 Bolts largest OD 185 and Weight of 30 grams and also bushing length 44mm this bolts is made for cast iron.

2nd This bolts head size is M5 & length of 7mm this nut & bolts also made of Cast iron

3rd CBY25 Nut & Bolts Used in this hydraulic hand fork lift.

Hexagonal Nut & Bolts are larger bolts with six side bolts. Six bolts attached with washer. This bolts head attached with collar this collar is provide the safety of shank. This bolts shank is longer with other bolts so this shank distribute the load capacity of hydraulic hand fork lift. Hexagonal bolts is fastly attached the wheel. In this bolts we use in hydraulic hand forklift channel attached, wheel, hydraulic rod.

As we all know nut and bolts are very important component so we have used it in our project. There are many types of nut bolts but we have used hexagonal nut & bolts because they are used with another shackles, bolts, screws, and other externally threaded components. Hex nuts, in combination with these other fasteners, are used to connect both metal and wood components to prevent tension and movement. We have used mild steel material nut & bolt for hydraulic hand fork lift.



4th Component we have used is hydraulic – this is also main component after nut & bolts because hydraulic is going to lift object as per requirement. We have used hydraulic system of 3 ton as per our requirement.

The Torin BIG RED T30306 hydraulic long hit jack has a single piston pump and clevis base that is designed for residential and commercial use. Fits most garage/shop cranes, engine hoists, and more. The lifting range is 24-3/8" to 43-7/8" with a 3 ton (6,000 lb) load capacity. This long ram jack is constructed of heavy-duty steel with a heat-treated chrome cylinder for added strength. It features a high-quality glide-action pressure pump designed to lift with minimal muscle and effort and has an integrated built-in oil-bypass and overload valve that protects the hydraulic system from extending beyond its travel limits. Hydraulics are powered with a high-quality oil, which offers better corrosion resistance and high/low temperature flexibility, allowing the unit to operate at temperatures between 40 degrees Fahrenheit and 105 degrees Fahrenheit. The piston ram is treated and polished to resist skiving and utilizes a Y-style polyurethane sealing ring with backup ring, preventing the load from falling slowly. The clevis style base provides added versatility. After a thorough chemical wash to ensure a long-lasting finish and to help prevent rust, it's treated with a powder-coated, lead-free paint, providing a durable coating which is oil, grease, and dirt-resistant for easy cleanup. This unit is 100% factory tested for reliability and safety to meet and comply with ASME PASE safety standards.



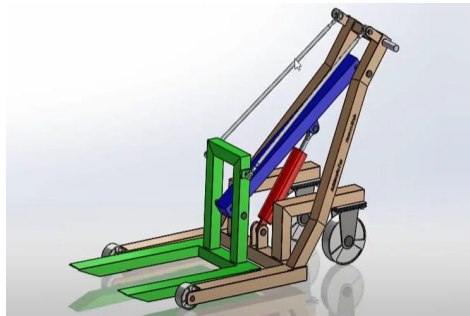
III. MATERIAL REQUIRED

List

1. RHS- rectangular hollow section
2. Welding & cutting machine
3. Rear Wheels
4. Front wheels
5. Hydraulic
6. Nut & bolts

IV. CONCLUSION

This is a hydraulic hand fork lift with a four-wheel drive. This lift is made with a low cost which be affordable to small scale industries and it can be made in very short time with good quality and with proper inspection before giving to the customer. This can lift a load upto 1 ton easily which have a load bearing capacity and can withstand the load and also can be adjustable on upward and downward direction as per requirement as per need with the help of hydraulic. Its wheels can be lock which will prevent accident if there is a slippery surface in industry and malls.

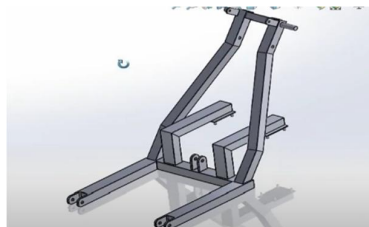


4.1 Advantages & Disadvantages

Advantages	Disadvantages
Can rotate 360 degree.	They have relatively slow speed.
Easy to handle	Oil problem
Unskilled person can operate	Leakages
Low maintenance	
Budget friendly	

4.2 Future Enhancement

- Can increase hydraulic/load capacity
- Can develop hydraulic system
- Can add motor
- Can increase material quality
- Can be modified as per requirement.



Total Costing

- Frame work : 3000
- hydraulic : 4000
- Rear Wheels : 2000
- Front wheels :1000
- Nut & bolts : 60 Rs/Kg.
- TOTAL : Rs 10000

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