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## DESIGN OF HYDRAULIC FLOOR CRANE

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# Design of Hydraulic Floor Crane

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**Abstract – A crane is a kind of machine, equipped with a hoist, wire ropes or chains, and sheaves, that can be used together to lift and lower materials and to move them horizontally. The hydraulic floor crane includes hydraulic cylinder, hydraulic tank, hydraulic hoses, truck, DCV, beam and hooks. The beam one end is fixed to the truck and another end is attached to the hooks. In this paper we analyze the design of hydraulic floor crane.**

**Keywords: Hydraulic, Crane structure**

## INTRODUCTION

The hydraulic floor cranes provide an efficient, low cost alternative to other material handling equipments. Strong, robust, sturdy and built to very standard, these cranes are maneuverable in loading, unloading and shifting of heavy loads. Crane structure consists of chassis, vertical column, horizontal arm, and the hydraulic pump with cylinder assembly. The box crane can take heavy loads effectively, avoids damage under rough and unskilled handling. A 'crane' is a type of machine, generally equipped with a hoist, wire ropes or chains, and sheaves, that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to other places. It uses one or more simple machines to create mechanical advantage and thus move loads beyond the normal capability of a man. Cranes are commonly employed in the transport industry for the loading and unloading of freight, in the construction industry for the movement of materials and in the manufacturing industry for the assembling of heavy equipment.

## REVIEW OF LITERATURE:

Material Handling is the movement, storage, control and protection of materials, goods and products throughout the process of manufacturing, distribution, consumption and disposal. The focus is on the methods, mechanical equipment, systems and related controls used to achieve these functions. Hydraulic cranes are an important part of the material handling equipment's. The hydraulic cranes that are being used work on electrical supply or manual power. A crane is a type of machine, generally equipped with a hoist, wire ropes or chains, and sheaves, that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to other places. It uses one or

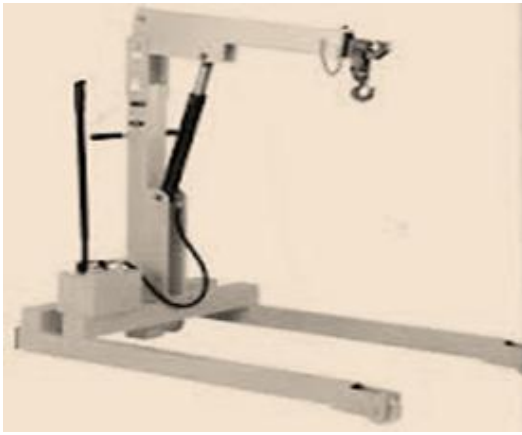
more simple machines to create mechanical advantage and thus move loads beyond the normal capability of a man. Cranes are commonly employed in the transport industry for the loading and unloading of freight, in the construction industry for the movement of materials and in the manufacturing industry for the assembling of heavy equipment.

## DESIGN WORK:

**Lifting capacity:** - The lifting capacity of hydraulic crane mainly depends on following (V.Jose Ananth).

1. **The lever:** - A balance crane contains a horizontal beam (the lever) pivoted about a point called the fulcrum. The principle of the lever allows a heavy load attached to the shorter end of the beam to be lifted by a smaller force applied in the opposite direction to the longer end of the beam. The ratio of the load's weight to the applied force is equal to the ratio of the lengths of the longer arm and the shorter arm, and is called the mechanical advantage. 2.

**The pulley:** - A jib crane contains a tilted strut (the jib) that supports a fixed pulley block. Cables are wrapped multiple times round the fixed block and round another block attached to the load. When the free end of the cable is pulled by hand or by a winding machine, the pulley system delivers a force to the load that is equal to the applied force multiplied by the number of lengths of cable passing between the two blocks. This number is the mechanical advantage.



### Hydraulic oil/fluid:

Hydraulic fluids, also called hydraulic liquids, are the medium by which power is transferred in hydraulic machinery. Common hydraulic fluids are based on mineral oil or water (DR. T. J. PRABHU, 2010). Examples of equipment that might use hydraulic fluids include excavators and backhoes, hydraulic brakes, power steering systems, transmissions, garbage trucks, aircraft flight control systems, lifts, and industrial machinery. Typically lubricants contain 90% base oil (most often petroleum fractions, called mineral oils) and less than 10% additives. Additives deliver reduced friction and wear, increased viscosity, improved viscosity index, resistance to corrosion and oxidation, aging or contamination, etc. Lubricants such as 2-cycle oil are added to fuels like gasoline which has low lubricity. Sulfur impurities in fuels also provide some lubrication properties, which have to be taken in account when switching to a low-sulfur diesel; biodiesel is a popular diesel fuel additive providing additional lubricity.

### CONCLUSION:

In this paper we found that hydraulic floor crane mechanism is capable of lifting load. We analyze that design and fabrication was a great success both in terms of strength and stiffness.

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