DESIGN OF HYDRAULIC LIFTING WHEEL EXCAVATOR

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Abstract – We know that the excavator will not be able to drive in the road. Because the excavator will be damage the road, it will move slowly, it will make a traffic and the excavator will be taken by lorry or heavy vehicle. Therefore, the travelling cost will be increased. So these kind of problems we find in the excavator. Then we find the solution to overcome these kind of problems is in excavator we are fixing lifting wheel. The lifting wheel will be working with the help of hydraulic system. The power of the wheel will be produced by hydraulic motor from hydraulic pump. So the wheel will be rotated. When we moved to the road side the lifting wheel will be lifted down .The track wheel of the excavator will be moved up. When the lifting wheel in down stage. Then we moved to the muddy surface the lifting wheel will be moved up on that stage the track wheel will be moved down. Next we used in muddy surface. This is concept of lifting wheel excavator. By using lifting wheel we can reduse road damage, traffic, cost, time of travelling and slow moving of excavator.

***Key Words*: Hydraulic Pump 1, Dead Axle 2, Lifting wheel 3, Cylinder 4, Three way value 5**

INTRODUCTION

Hydraulic excavators are also called diggers. They are used for a variety of applications as they are used as high-performance excavators. These types of excavators are particularly useful in work areas that are more of confinement and less of acquiescence to conventional apparatus. Be it construction of roads and pipelines or huge processes like mining and the excavation of potential rocks.

The parts of a hydraulic excavator through which the wok is geared up, consist of hydraulic cylinders, an arm, a boom, and a bucket. The actual job of this equipment is of digging and loading. The fluid level plays an important role as Hydraulics is all about fluids and mechanics. Regulation of the oil level in the cylinder of the hydraulic excavator can influence the movement accuracy of the operational equipment. Hydraulic excavators when viewed in action is always tends us to compare the movements of this operational apparatus to the movements of an actual human arm. The boom part of the excavator resembles more of the upper portion of a human arm, together with the elbow and the shoulder. The arm part seems like the portion of an arm starting at the elbow and ending at the wrist. What more? The bucket portion is comparable to a cupped hand. Though the arm of the equipment does all the digging work, it is not the only imperative portion of a hydraulic excavator. Actually the heart of the machine will be the upper structure of an excavator. This credential is because it holds the engine, the pump and hydraulic tank, and the swing motors. It is true that without these important the excavator cannot dig and load.

OBJECTIVES OF THE PROJECT

The main objective of the project is to design the project is to design the hydraulic lifting wheel excavator are,

a) To prevent road damage.

b) To prevent road traffic.

c) To reduse moving or travelling cost of the vehicle from one place to another place.

PROBLEM IN THIS EXSTING METHOD

The main problem in the existing method is,

- Excavator will drive in the road it will damage the road
- Travelling cost.
- It will move very slowly in road
- It cannot be drive the vehicle in the road.
- Become traffics in roads.

INSTRUMENTATION

HYDRAULIC MOTOR

Oil driven engines are rotating actuators that convert pressure driven, or liquid vitality into mechanical force. They work pair with a pressure driven siphon, which changes over mechanical force into liquid or water driven

force. Water driven engines give the power and supply the movement to move an outside burden.

DEAD AXLE

A dead hub is a pivot that isn't associated with the motor, which means it doesn't turn under its own capacity. Its wheels turn just when the vehicle is moving, brought about by the drive pivot. Dead axles exist basically for load-bearing purposes. They help to circulate the heaviness of the vehicle, which is the reason numerous huge trucks have different dead axles.

Fig-1: Dead Axle

HYDRAULIC HOSES

A hose is explicitly intended to pass on pressure driven liquid to or among water driven segments, valves, actuators, and devices. It is commonly adaptable, regularly strengthened, and for the most part built with a few layers of fortification since water driven frame works much of the time work high weights. Water driven hose is utilized in an assortment of mechanical pressure driven frame works. Water powered hose gives an essential way to moving liquid starting with one segment the non to the next, and simultaneously supplies an intrinsic adaptability of a shioners.

Fig -2: Hydraulic Hose

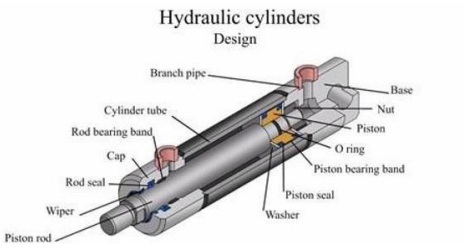
HYDRAULIC CYLINDERS

A water driven chamber (likewise called a straight pressure driven engine) is a mechanical actuator that is utilized to give a unidirectional power through a unidirectional stroke. It has numerous applications, prominently in development hardware (building vehicles), fabricating apparatus, and structural designing. Water powered chambers get their capacity from pressurized pressure driven liquid, which is normally oil.

The water driven chamber comprises of a chamber barrel, in which a cylinder associated with a cylinder pole moves to and fro. The barrel is shut toward one side by the chamber base (likewise called the top) and the opposite end by the chamber head (additionally called the organ) where the cylinder pole leaves the chamber. The cylinder has sliding rings and seals. The cylinder partitions within the chamber into two chambers, the base chamber (top end) and the cylinder bar side chamber (bar end/head end). Ribs, trunnions, clevises, and hauls are regular chamber

Fig-3: Hydraulic Cylinder

THREE WAY VALVE



Three, four and five-way ball valves are called multi-port valves. The three-way ball valve is the most widely recognized multi-port ball valve. A three-way ball valve has three ports or openings that are associated with funneling or tubing for gas or liquid stream (media) to go through. These ports are normally depicted as one channel and two outlet ports or one outlet and two bay ports relying on the stream course through the valve. Three-way ball valves are well known on the grounds that they are an affordable and basic method for giving both shut off and stream course control in a solitary valve body. Controlling move through a three-way valve is finished with a mix of how the funneling is set up, the handle revolution of the valve ball and the stream way through the valve ball (the ball bore or porting).

Most flat sort L design stream valves will have handles that are constrained to 180 degrees of turn. This accommodates three stream alternatives:

- Left stream
- Right stream
- Cut off or close off stream

Once more, this sort of L-design stream three-way ball valve is generally portrayed as a three position valve.

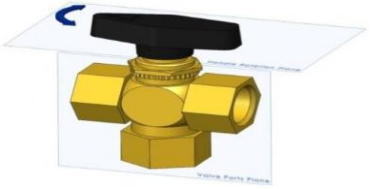


Fig-4: Three Way Value

CONSTRUCTION AND WORKING OF LIFTING WHEEL

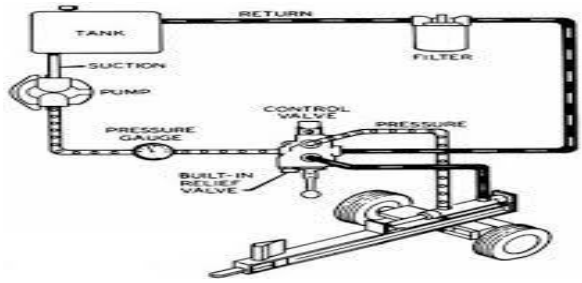


Fig-5: Working of Lifting Wheel

The lifting wheel excavator will work with the help of diesel engine and hydraulic pump. The engine flywheel or driving shaft is connected to the driven shaft of hydraulic pump. The pump will be connected to the reservoir. So the pump working operation is it makes low pressure oil to high pressure oil with the help of engine drive. The engine power is transmitted to hydraulic pump in driven shaft. The driven shaft connected to the cylinder block of hydraulic pump. The cylinder block connected to the cylindrical rod and cylindrical rod are connected in swash plate. The swash plate is connected with driven shaft and cylinder block .When the driven shaft rotates the cylinder block with help of engine .The swash plate slide in a angle of 80 degree or 70 degree .In a swash plate number of cylinder rod connected. So the cylinder rod rotating with swash plate inside the cylinder block vacuum is creating sucking the oil from reservoir into low pressure to high pressure. The high pressurized oil or fluid pass through the pressure gauge. The pressure gauge will passes the oil in correct pressure level to control valve. The control valve will be control the fluid and pass through the fluid in double acting cylinder or actuator it will push the wheel down and the wheel will be landed in road. The control valve will be control the fluid and pass through the fluid in bent axle swash motor will be work with the help high pressurized oil. The wheel will be connected to the bent axle hydraulic motor. So the wheel will be rotated.

DESIGNING OF HYDRAULIC LIFTING WHEEL EXCAVATOR

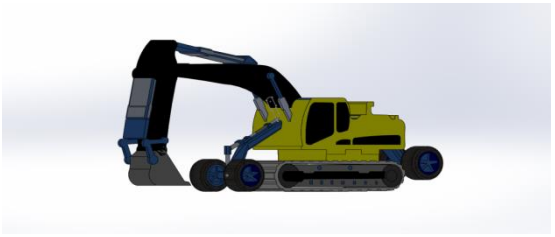


Fig-6: Lifting Wheel Excavator

Fig-7: Front View

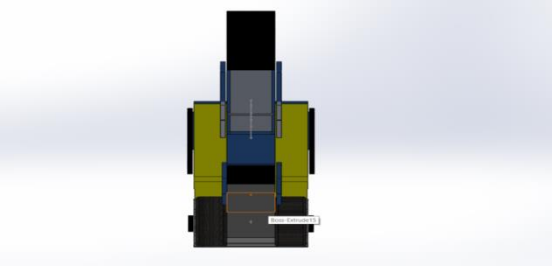


Fig-8: Side View

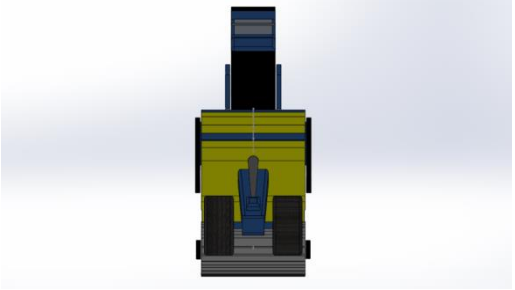


Fig-9: Back View

CONCLUSIONS

Subsequently the outcome is that the ordinary excavator ishelped with the wheels so the excavator can have the option to go in both the lopsided landscape places and furthermorein the street surfaces with the assistance of the helped wheels. In the lopsided spots the extra wheels will be in theperfect position, if the excavator is expected to go in the street surfaces the extra wheels are lifted down with the assistance of the pressure driven chambers. At that point the three-way valve is utilized to redirect the pressure driven capacity to the extra wheel arrangement. The pressure driven force runs the water powered engine and afterwardthe water driven engine pushes the wheels.

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