



Dual side Hydraulic vehicle lifting machine

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ABSTRACT:

An Automobile hydraulic jack can be easily operated by a single push button provided on the dash board. The jack will be installed on both the sides of chassis according to the weight distributions of the car. Similarly it will be installed on the other side of the car. The system operates on hydraulic drive which consists of three main parts: hydraulic pump, driven by an electric motor, hydraulic cylinder to lift the vehicle. The hydraulic jacks actuate separately for either side of car as per the breakdown condition. The car gets lifted and load gets distributed on three point i.e., plunger or ram of hydraulic cylinder and two tires opposite to side which is lifted. This jack will be very useful for all the senior citizens and especially for females (ladies) who find it extremely difficult to operate the jack manually in any breakdown condition. The motive behind using hydraulic system instead of a pneumatic system is the more power produced by the system and simple in design as compared to a pneumatic design. As the hydraulic oil is incompressible so the lifting capacity is more in comparison with the pneumatic system which operates on air which is compressible.

INTRODUCTION:

Hydraulic jacks work on the basis of Pascal's Principle, named for Blaise Pascal, who lived in the seventeenth century. Basically, the principle states that the pressure in a closed container is the same at all points. Pressure is described mathematically by a Force divided by Area.

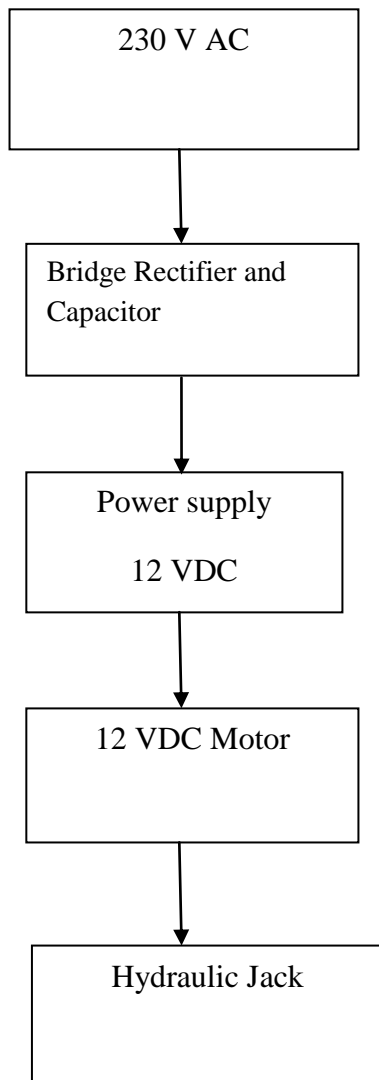
A hydraulic jack is a device used to lift heavy loads. The device itself is light, compact and portable, but is capable of exerting great force. The device pushes liquid against a piston; pressure is built in the jack's container. It helps the user for changing of tires whenever they were busted or punctured. Hydraulic jack system is attached to automobile vehicle on front and rear part of the chassis. An automobile hydraulic jack system can be easily attached to all currently manufacture automobile chassis and frames.

METHODOLOGY:

1)Working Principle:

This MOTORIZED JACK has one 12 VDC motor. This DC motor drive is transmitted to the jack unit through the CRANK mechanism. The vehicle tyre is lifted up and down by pressing the switch in the panel board. The 12 V DC supply is supplied from the 12 V DC motor. The vehicle tyre is moved up slowly without any sack .

2)Block Diagram: The working principle of HYDRAULIC JACK is explained in the block diagram.



3)COMPONENTS:

- **12 VDC Motor**

This DC motor is shunt type 12 DC motor. It has high torque and low speed capacity. The DC Motor drives transmitted to the handle of the jack.

This motor is having built in type speed reduction gear box unit. It has high torque and low speed capacity. The electrical supply to the motor is from 12 V DC power supply.

- **Hydraulic Jack**

A Hydraulic Jack or for that matter any device using Hydraulic Power in its simplest possible shape consists of five fundamental components.

The Hydraulic Reservoir storing the Hydraulic Oil (Oil is used as the medium to transmit force and motion-such fluids are called Hydraulic Oils) should be thoroughly clean, whether integrally built-in or used as a separate tank.

Pump, either of the integral or the remote control type, comprises of highly precision engineered pump plunger, cylinder, suction and delivery valves, safety valves with conical or steel balls matched with micron tolerances. Very often O Rings and special seals are used, made from specially treated leather or synthetic nitrile rubber or Teflon or other modern substitutes for greater resistance to wear and sealing over.

It is imperative that these must function at peak efficiency by regular cleaning and flushing of foreign particles which enter into the hydraulic system and may clog the delicate valves, damage the seals and affect the functioning of other elements in the hydraulic circuit.

- **12 VDC Power Supply**

All the electronic components starting from diode to Intel IC's only work with a DC supply ranging from +5V to +12V. We are utilizing for the same, the cheapest and commonly available energy source of 230V-50Hz and stepping down, rectifying, filtering and regulating the voltage.

- **Frame Stand:**

This base frame stand made in 250mm size x 5mm thick M.S. material base plate and is used to hold the entire mechanism and support the motor also.



ADVANTAGES:

1. Single person is enough to operate this efficiently to lift the tyre.
2. Easy and efficient handling of this unit without wastage or damage to any other parts.
3. Increase the unit life.
4. Least maintenance of the equipment.
5. Need not require any individual work place.
6. Can be worked in the work spot.

CONCLUSION:

An inbuilt hydraulic jack system can be easily attached to all currently manufacture automobile chassis and frames. There is a front suspension hydraulic jack that is mounted centrally to the front suspension of an automobile between its front wheels. There is also a rear suspension hydraulic jack that is mounted centrally to the rear suspension of the automobile between its rear wheels. The system operates on the hydraulic power. This arrangement has many advantages such as maintenance and servicing of vehicle. With the help of this system the driving of vehicles will be easy especially for ladies. Arrangement is also very useful for heavy loading vehicles and a single person can go on a long drive. Whole system is operated by 12 volt DC battery; hence jacks will also work, when vehicle will not in starting condition. Both jacks can work simultaneously at a single time also.

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