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SMART CAR JACK USING BLUETOOTH AND ANDROID TECHNOLOGY

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ABSTRACT

The automotive jack is a device used to raise all or part of a vehicle into the air in order to facilitate repairs. Most people are familiar with the basic car jack (manually operated) that is still included as standard equipment with most new cars. These days a car jack is an important tool to have in your vehicle due to unknown upcoming situations like flat tire in your journey. Even so, people who like to rotate their tires themselves or who may install snow tires before the winter and remove them in the spring need to use the jack to perform the job. Changing a flat tire is not a very pleasant experience. Women have a much lighter skeleton that means, among other things, women cannot pull more force as well as men and are a greater risk of skeletal injuries. Improvement in automotive car jack is really needed to make the tool more efficient, user friendly, practical to use, changes in industry direction and most importantly high safety features. Further research on car jack is very important. Opening the manual car jack is quite difficult pregnant women and old men. The purpose of this project is to encounter such problems.

The Bluetooth device in the smart phone connects wirelessly and sends the required drive signal to Bluetooth hardware device and this signal now drives with microcontroller and generates the output to bidirectional motor driver which now rotates the wiper motor in reverse and forward direction and the motor shaft is coupled to scissor lift jack mechanism using suitable coupler between the two, and lifts the jack mechanism.

INTRODUCTION

An automotive jack is a device used to raise all or part of a vehicle into the air in order to facilitate vehicle maintenances or breakdown repairs. Most people are familiar with the basic car jack (manually operated) and it is included as standard equipment for most of the

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new cars. Vehicle owners who would like to rotate their tires themselves either front to back and so forth or who may install snow tires before the winter and remove them in the spring need to use a jack to perform the job. Changing a flat tire is not a very pleasant experience. Nowadays, a variety of car jacks, however, are typically manually operated and therefore require substantial laborious physical effort on the part of the user. Such jacks present difficulties for the elderly and handicapped and are especially disadvantageous under bad weather conditions.

A mechanical jack is a device which lifts equipment. The most common form is a car jack or garage jack which lifts vehicles so that maintenance can be performed. Car jacks usually use mechanical advantage to allow a human to lift a vehicle. More powerful jacks use hydraulic power to provide more lift over a greater distance. The increase in globalisation and industrialisation has led to increase in vehicles accordingly and maintenance for the vehicles like tyres replace and tyres maintenance bit difficult for drivers. Using existing method of jacks creates a lot of problems and offers a bit laborious way of operation. The method we are using for this project is a combination of electro mechanical arrangements which lifts the vehicle with smart phone technologies. The Bluetooth communication media is used to communicate from mobile to mechanical arrangement which generates the signal and vehicle is lifted in up and down directions.

OBJECTIVES

- To design a car jack that is safe, reliable and able to raise and lower height level.
- To develop a car jack that is powered by internal car power and automated button system.
- Manual power is not required.
- Handling is easy.
- It requires simple maintenance cares.
- Low maintenance cost.
- It eliminates oil leakage problems compared to hydraulic jack.
- It also incorporates it into the car auto system (e.g., cigarette lighter sockets or clipped to the 12V battery)

METHODOLOGY :

A jack is a mechanical device used to lift heavy loads or apply great forces. Jacks employ a screw thread or hydraulic cylinder to apply very high linear forces. A mechanical

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jack is a device which lifts heavy equipment. The most common form is a car jack, floor jack or garage jack which lifts vehicles so that maintenance can be performed. Car jacks usually use mechanical advantage to allow a human to lift a vehicle by manual force alone. More powerful jacks use hydraulic power to provide more lift over greater distances. Mechanical jacks are usually rated for a maximum lifting capacity.

SCISSOR JACK:

Scissor jacks are simple mechanisms used to drive large loads over short distances. The power screw design of a common scissor jack reduces the amount of force required by the user to drive the mechanism. Most scissor jacks are similar in design, consisting of four main members driven by a power screw. A scissor jack is operated simply by turning a small crank that is inserted into one end of the scissor jack. This crank is usually "Z" shaped. The end fits into a ring hole mounted on the end of the screw, which is the object of force on the scissor jack. When this crank is turned, the screw turns, and this raises the jack. The screw acts like a gear mechanism. It has teeth (the screw thread), which turn and move the two arms, producing work. Just by turning this screw thread, the scissor jack can lift a vehicle that is several thousand pounds. Power screw in a scissor jack is the foundation of whole mechanism of scissor jack.

The term "scissor jack" describes a wide variety of tools that all follow the same principle: using crossed beams to lift something. They do this by acting on the object they are lifting in a diagonal manner; the lift on the right side lifts the object from its left side and vice versa. This allows the user to store the jack when it is not in use (with the diagonal beams flat) and to expand it when it is needed.

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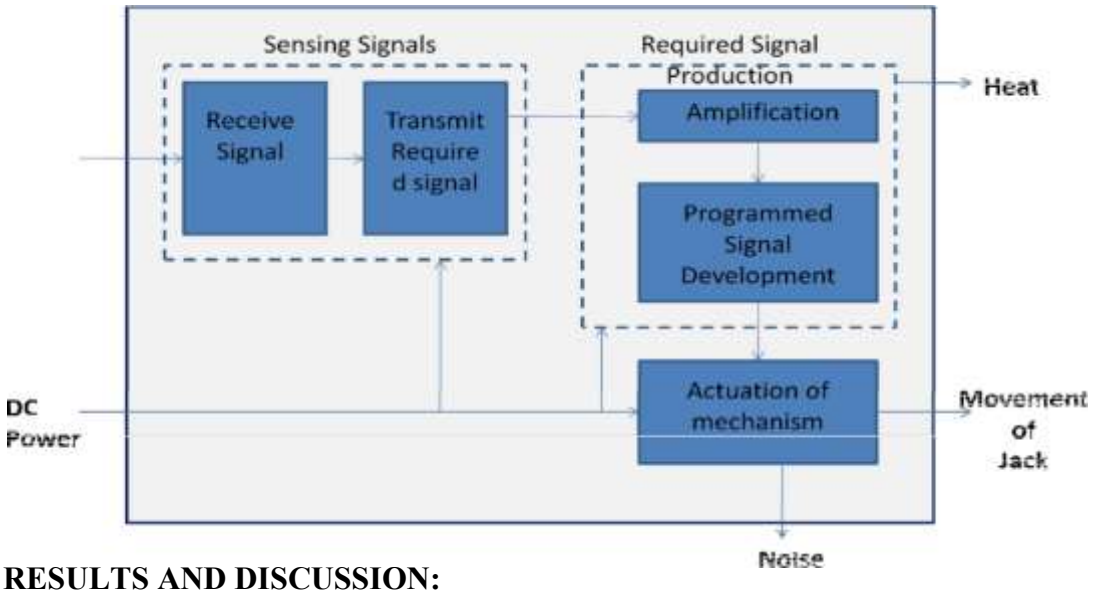
FUNCTIONAL REQUIREMENTS:

A functional requirement defines a function of a system and its components. A function is described as a set of inputs, the behavior and outputs.

SI No.	Requirements	Specification
1	Arduino UNO	5V
2	Wi-Fi Module	ESP8266
3	DC Motor	DC
4	Motor Driver	L298N
5	Wires	BC547
6	Battery	9V

Detailed Block Diagram Representation:



RESULTS AND DISCUSSION:

Lifting of vehicle

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Automatic Jack System for a motor vehicle allows the individual to quickly and safely raise and lower the vehicle thereby facilitating the efficient process of changing the tire of a vehicle. It will be easy for elderly or handicapped individual to jack up the motor vehicle completely. It also eliminates the messy process of manually jacking up a vehicle.

CONCLUSION

An inbuilt automatic jack system can be easily attached to all currently manufactured chassis and frames. By the android app, the movement of the jack from front suspension is mounted centrally to the front suspension of an automobile between its front wheels. According to the topological conditions, jack will be sufficient enough in achieving the horizontal levelling. With the help of car battery which is a 12V battery source the movement of the jack from front to back and vice-versa is possible. Android app can be installed/mounted in the dashboard for displaying the movement of the jack. With all the car jacks available in the market, this model is improvised on the features and design. The main objective of this design is safety, reliability and quick movement of the vehicle which is achieved by making use of the car battery and automated with the android app. Considering some specifications based on testing and analysis, it is considered safe to use automated jack system. The torque supplied on the system is more enough to lift the cars which are having a weight of up to 2500 Kg.

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