

Synopsis

1. Title of Project-

Wifi Internet Controlled Hydraulic Scissor Lifter Model

2. Objective of the study-

- (i) To make a Hydraulic Scissor Lifter by using Scissor Mechanism for compact design.
- (ii) To lift heavy loads by Hydraulic Leverage.
- (iii) Enable Hydraulic Scissor Lifter Wifi internet connected so it can be Controlled and Monitored remotely.

3. Rationale for the study-

- (i) Learn about Scissor Mechanism, Class-1 Leverage, Cross-braced arms(Criss-cross X-patterns), link systems, folding support.
- (ii) To study about Pascal's law and uses of Hydraulic leverage to lift heavy loads.
- (iii) To learn the process of how to connect physical things to the Internet and control & monitor remotely. Learn about IoT & Electronics and integrate to a Mechanical system.

4. Detailed Methodology used for study-

- (i) Research and Understanding using the Internet and books about scissor mechanisms, class-1 leverage, and hydraulic systems. Gain insights into IoT technology and its application in connecting physical objects to the internet for remote control and monitoring.
- (ii) Design and Planning- Based on Load capacity, desired Height range, compactness and stability. For the model we will use Wood Sticks as Scissors arm, Syringe as a Lift cylinder and Motor- Syringe combination as a Hydraulic pump. To integrate this mechanical system with Wifi internet will use a Wifi internet enabled Microcontroller module and design schematics & circuit accordingly.

Project Planning and Resources Folder-

<https://drive.google.com/drive/folders/1Q-h4NLbMkmBsdpBIGQFpYtT1N3Pb2OyV?usp=sharing>

- (iii) Assembly and Fabrication- Assemble the hydraulic scissor lifter according to our design plan. Start by constructing the scissor mechanism using cross-braced arms and link systems. Install the hydraulic cylinders and valves, ensuring proper alignment and connections. Fabricate any additional support structures or components as needed.
- (iv) Integration of IoT- Program the microcontroller to communicate with a designated IoT platform or mobile application via WiFi. Implement features such as lift Up/down, real-time status updates, remote activation/deactivation, and safety protocols to enhance usability and convenience.
- (v) Calibration and Testing- Calibrate the hydraulic system to ensure optimal performance, stability and load-bearing capacity according to the commands and analog signal received via the wifi internet from the operator. Gather feedback from test users and stakeholders to identify any areas for improvement or optimization.
- (vi) We will document the entire process of designing, building, and testing the hydraulic scissor lifter, including detailed schematics, assembly instructions, and test results.

7. Places/labs/equipment and tools required and planning of arrangements-

- (i) Basic cutting, shaping, fabrication tools like cutter, plier, screw drivers, measuring tape, scale.
- (ii) Plastic adhesive, glue.
- (iii) Electronics lab equipment like Multimeter, Variable power supply, Programming USB cables etc. and electronics tools like screwdrivers, wire stripper , cutter, soldering iron.
- (iv) Electronics Components Manuals and Data sheets.
- (iv) Arduino IDE software, IoT Website platform and necessary software things.

8. Problem envisaged in carrying out the project, if any-

No Problem

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