

180⁰ TURNING OF CAR BY USING ELECTRO-PNEUMATIC SYSTEM**Mr. Mule H. B.*¹, Mr. Mahale R. S.², Mr. Dumbre D. A.³ & Mr. Nalawade H. M.⁴**^{*1}Diploma Student mechanical Engineering Jaihind Polytechnic, kuran, Pune, India²Diploma Student mechanical Engineering Jaihind Polytechnic, kuran, Pune, India³Diploma Student mechanical Engineering Jaihind Polytechnic, kuran, Pune, India⁴Diploma Student mechanical Engineering Jaihind Polytechnic, kuran, Pune, India

Keywords: scissor jack, pneumatic system, battery, lift.**ABSTRACT**

A jack is mechanical device used to lift heavy loads. Jacks employ a screw thread or pneumatic cylinder to apply very high linear forces. The most common form is a car jack. Car jacks usually Use pneumatic System for lifting the vehicle. Mechanical jacks are usually rated for a maximum lifting capacity. Scissor jacks are simple mechanisms used to drive large loads short distances and this jack can lift a vehicle that is several amount of weight. 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. Design of this Scissor jack is "Z" type. Main part of scissor jack is power screw. The end into a ring hole mounted on the end of the screw. Power screw in a scissor jack is the foundation of whole mechanism of scissor jack. The screw acts like a gear mechanism. Just by turning this screw thread, the scissor jack can lift a vehicle that is several thousand weights.

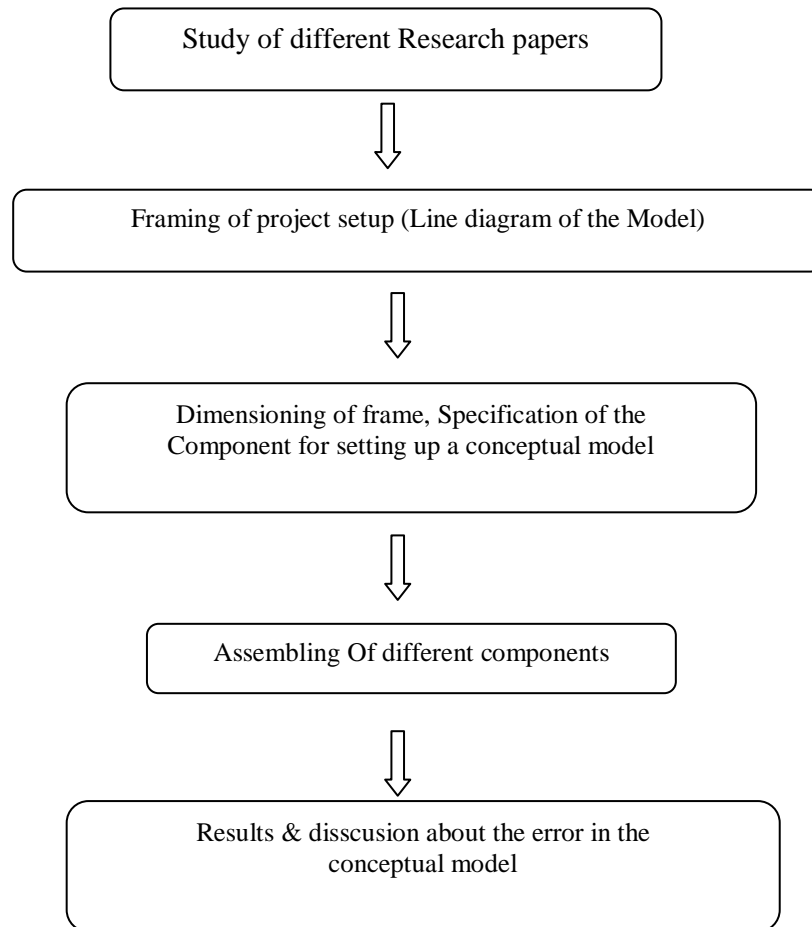
INTRODUCTION

A scissor lift it is a device which is usually use for lifting in vertical direction. The mechanism to achieve this is the use of linked, folding supports in a criss-cross "X" pattern. The lifting is done by use of pressure to the outside of the lowest set of supports, elongating the crossing pattern, and propelling the work platform vertically. The machine consists of a worm and worm wheel, gear arrangement, shaft in a slot and the lift scissors. Rotation of handle attached to worm/worm wheel drives the system.

MATERIALS

- 1) 5/3 Direction control valve (DCV)
- 2) DC Motor (10 rpm)
- 3) Square tube (C.I.)
- 4) Fiber glass (5mm thick)
- 5) Pneumatic cylinder (Pressure 0.1 To 0.7 Mpa)
- 6) Spring
- 7) Flat plate (C.I.)
- 8) L-angle (C.I.)
- 9) Adjusting Sliding rod (M.S.)
- 10) Bottom Frame (C.I.)
- 11) Top Platform (C.I.)
- 12) Nut Bolt (M.S.)

METHODOLOGY OF WORKING PROCESS



FORMULAE

$$(1) \quad P_E = \frac{\pi^2 EI}{L^2}$$

$$(2) \quad \text{Pressure}(P) = \frac{F}{A}$$

$$(3) \quad I = \frac{\pi d^4}{64} = \frac{AK^2}{1}$$

$$(4) \quad \sigma_C = \frac{Pd}{2t}$$

$$(5) \quad \sigma_L = \frac{Pd}{4t}$$

CONCLUSION

- 1) This device rotates a car in any direction up to 360°.
- 2) It can use as maintenance purpose.
- 3) Also can useful for changing & replacing.

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