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Design and Development of Seatbelt Activated Handbrake System Using Pneumatic Mechanism

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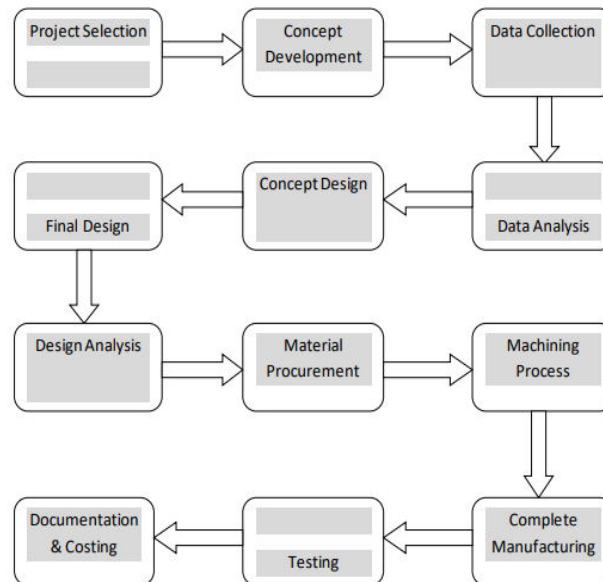
ABSTRACT : In a ground vehicle, mechanical parking brake (Hand brake) unit is a mechanism that used to hold the vehicle stationary either on the even or slope road. It consists of a directly connected to the brake mechanism on one end and to a mechanism that can be actuated by the driver on the other end. This actuating mechanism is often a hand-operated lever on the floor on either side of the driver, or a pull handle located below and near the driver seat. In order to ensure that a vehicle remains stationary when it is parked at a certain road slope, the driver has to apply sufficient pulling force on the handbrake lever. Seat belt is implemented in car to ensure drivers safety. The increase in number of loss of life in accidents is due to driver's negligence to wear seat belt though it is strictly enforced by law. The aim of our paper is to make seat belt wearing compulsory for vehicle propulsion. We can achieve it by using pneumatic setup along with handbrake. The modification to be done ensures that the driver wears seat belt during driving. Here the seat belt of the car activates the hand brake (parking brake) through a pneumatic cylinder. When the seat belt activates the push button type DC valve an outward stroke is been obtained in the pneumatic cylinder through an air compressor which is used to release the hand brake. Similarly during the retracing stroke of the piston the hand brake is been engaged. The main benefit of this system is that passenger/driver safety, if we don't use seatbelt the vehicle handbrake dose not removes for safety. This system will be implemented in car to ensure passengers/driver safety. It reduces in number of loss of life in accidents. We can achieve it by using pneumatic setup along with handbrake.

KEYWORDS: SAFETY, SEAT BELT, HAND BRAKE, PNEUMATIC SYSTEM

I. INTRODUCTION

The main purpose of this project is to ensure drivers safety through a modified handbrake in car. A handbrake is an additional braking mechanism installed on all commercial vehicles that's completely separate from foot pedal - operated In cars the parking brake, also called hand brake, emergency brake, or brake, is a latching brake, usually used to keep the vehicle stationary. Most commonly used to prevent the vehicle from rolling when it is parked. Automobile hand brakes consist of a cable directly connected to the brake mechanism on one end and to a lever at the driver's position. Using your handbrake to stop a moving car can damage the brake system. Pneumatics is a section of technology that deals with the study and application of pressurized gas to produce mechanical motion. Pneumatic systems that are used extensively in industry and factories are commonly plumbed with compressed air or compressed inert gases. This is because a centrally located and electrically powered compressor, that powers cylinders and other pneumatic devices through solenoid valves, can often provide motive power in a cheaper, safer, more flexible, and more reliable way than a large number of electric motors and actuators. Pneumatics also has applications in dentistry, construction, mining, and other areas. Welding, superior insulating qualities and design versatility. Simplicity of design and control - Machines are easily designed using standard cylinders and other components, and operate via simple on-off control. Reliability- Pneumatic systems generally have long operating lives and require little maintenance. Because gas is compressible, Equipment is less subject to shock damage. Gas absorbs excessive force, whereas fluid in hydraulics directly transfers force. Compressed gas can be stored, so machines still run for a while if electrical power is lost.

II. METHODOLOGY



1. Proposed Methodology 1: Basic Information & Literature survey. This project report discusses about how to use literature data & identify the problems from field. By studying the literature of previously available system that help in maximizing the output by minimizing the effort, cost, time & money in future develop new machine.

2. Proposed Methodology 2: Identify & Design of system Components Available in Market. This project work will first introduce the background of the study. Presents the design constraints that influence on the use, efficiency & benefits their impacts on machine. After that machine parts design all different existing machine assembly units will done to make a probable machine model.

3. Proposed Methodology 3: Selection of Components for system as per design specifications. We will discuss the construction & working of system components. Various resources and factors were considered for getting the information on the project: First, the requirement of the field is to identify. The specification of the material is thought according to the need. Then, the allocation of budget is taken into consideration. Different research papers were read, we visited many markets & fields. Guidance was taken from college staff regarding the initial research of project. The Resources/Consumable required are: The main components of machine are to be purchase.

4. Proposed Methodology 4: CAD modelling & Fabrication of system parts. This project work will start to manufacture after purchasing of required specification material & making sample simulations which will be easy for visualization. After that manufacturing procedure of machine will be done, after this cost estimation of machine will calculate.

5. Proposed Methodology 5: Assembly & Testing of system. Finally, after complete manufacturing procedure, will test the working model which will satisfy probable objectives or not. After that complete working & satisfied testing will discuss advantages & applications of the machine while performing satisfied operation with complete report writing.

III. CONCLUSION

While concluding this report, we feel quite fulfil in having completed the project assignment well on time, we had enormous practical experience on fulfilment of the manufacturing schedules of the working project model. We are therefore, happy to state that the in calculation of mechanical aptitude proved to be a very useful purpose. Although the design criterions imposed challenging problems which, however were overcome by us due to availability of good reference books. The selection of choice raw materials helped us in machining of the various components to very close tolerance and thereby minimizing the level of balancing problem. Needless to emphasis here that we had lift no stone unturned in our potential efforts during machining, fabrication and assembly work of the project model to our entire satisfaction.

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