

DESIGN AND FABRICATION OF BALANCING MECHANISM FOR TWO WHEELER

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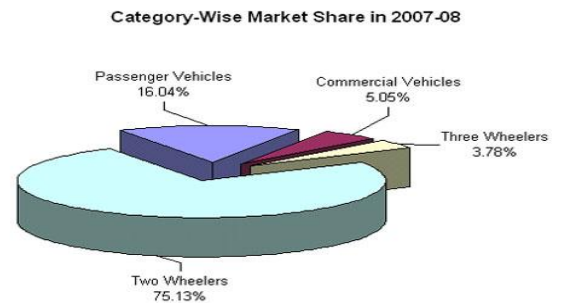
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ABSTRACT: This paper focuses on concept of designing and development of a mechanism for two wheeler which avoids the need of balancing the vehicle during heavy traffic jams, long signals, low speeds etc. This mechanism neutralizes the use of feet during above mentioned conditions which may arise at traffic. The technical constraints that has to be considered while designing and developing the mechanism was to achieve stability, linear and uniform speed of actuation of actuator shaft, topple conditions etc. In near future, more sophisticated wheels can be used for various motions such as taking a turn, U turn etc. Though complete comfort is not reachable, this project may tend to fulfil the requirements partially.

1. INTRODUCTION:

India, like other developing countries, is characterized by its rising population, mounting urbanization and motorization and low per-capita income. There is a tremendous growth in population of metropolitan cities like Mumbai, Delhi, Kolkata, Chennai containing more than 10 million residents .As these Indian cities grown in population, they have also spread outward. This greatly increased the number and length of trips for most Indians, forcing further reliance on motorized transport. Longer trips make walking and cycling less feasible, while increased motor vehicle traffic makes walking and cycling less safe.

At the same time, rising incomes among India's middle and upper classes make car and motorcycle ownership increasingly affordable. Following diagram shows the share of two wheelers among all types of 1. vehicles (as per 2007-2008).



By analysing the current scenario there is tremendous increase in two wheeler which may come with some problems which are discussed below.

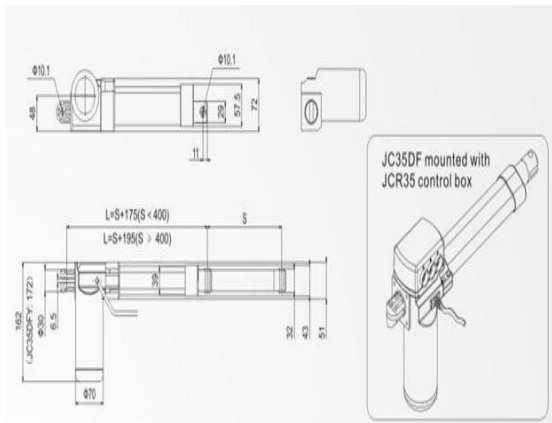
2.PROBLEM IDENTIFICATION:

As per study carried out on two wheelers the following problems are noted down which are as follows:

1. There is a need to balance the vehicle at the time of heavy traffic jams,long signals,low speed etc.
2. More physical stress is developed to balance the vehicle at the critical conditions.
3. There is a hazardous situation where if the vehicle is not balance properly then it may lead to accidents.

3. COMPONENTS USED IN FABRICATION:

1.Linear actuator (24 V): A linear actuator is an actuator that creates motion in a straight line, in contrast to the circular motion of a conventional electric motor. Linear actuators are used in machine tools and industrial machinery, in computer peripherals such as disk drives and printers, in valves and dampers, and in many other places where linear motion is required. Hydraulic or pneumatic cylinders inherently produce linear motion. Many other mechanisms are used to generate linear motion from a rotating motor.

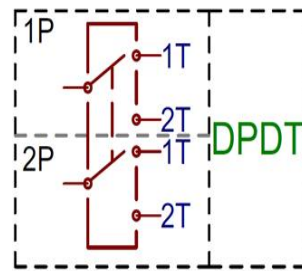


2. Battery (24V): An electric battery is a device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy. Each cell contains a positive terminal, or cathode, and a negative terminal, or anode. Electrolytes allow ions to move between the electrodes and terminals, which allows current to flow out of the battery to perform work. Primary (single-use or "disposable") batteries are used once and discarded; the electrode materials are irreversibly changed during discharge. Common examples are the alkaline battery used for flashlights and a multitude of portable devices. Secondary (rechargeable batteries) can be discharged and recharged multiple times; the original composition of the electrodes can be restored by reverse current. Examples include the lead-acid batteries used in vehicles and lithium ion batteries used for portable electronics. Batteries come in many shapes and sizes, from miniature cells used to power hearing aids and wristwatches to battery banks the size of rooms that provide standby power for telephone exchanges and computer data centers.

3. Castor wheels : A caster (or castor) is an undriven, single, double, or compound wheel that is designed to be mounted to the bottom of a larger object (the "vehicle") so as to enable that object to be easily moved. They are available in various sizes, and are commonly made of rubber, plastic, nylon, aluminum, or stainless steel. Casters are found in numerous applications, including shopping carts, office chairs, and material handling equipment. High capacity, heavy duty casters are used in many industrial applications, such as platform trucks, carts, assemblies, and tow lines in plants. Generally, casters operate well on smooth and flat surfaces.

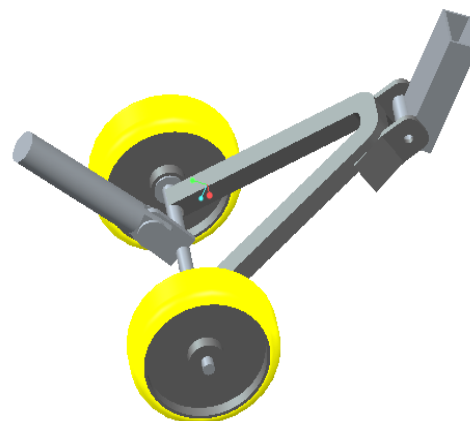
4. Actuation switch: DTDP -In electrical engineering, a switch is an electrical component that can break an electrical circuit, interrupting the current or diverting it from one conductor to another. The mechanism of a

switch may be operated directly by a human operator to control a circuit (for example, a light switch or a keyboard button), may be operated by a moving object such as a door-operated switch, or may be operated by some sensing element for pressure, temperature or flow. A relay is a switch that is operated by electricity. Switches are made to handle a wide range of voltages and currents; very large switches may be used to isolate high-voltage circuits in electrical substations.



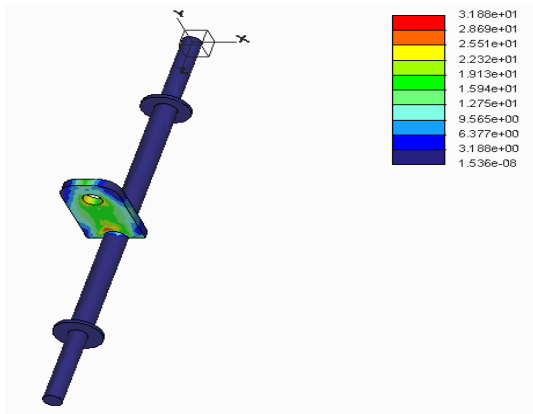
4. Working of mechanism: The basic idea of this mechanism is to balance the vehicle at the mentioned conditions. A DTDP switch is attached at the control panel. This switch initiates and regulates the supply current which is fed to actuator. The actuator is given by supply current which actuates the actuating rod to move linearly downward. This actuating rod further moves the shaft on which heavy duty castors are mounted. As soon as the castors touches the ground, switch is released which in turn stops the input current. At the time of heavy traffic jams, this mechanism is activated and vehicle is balanced.

4.1 CAD Model:

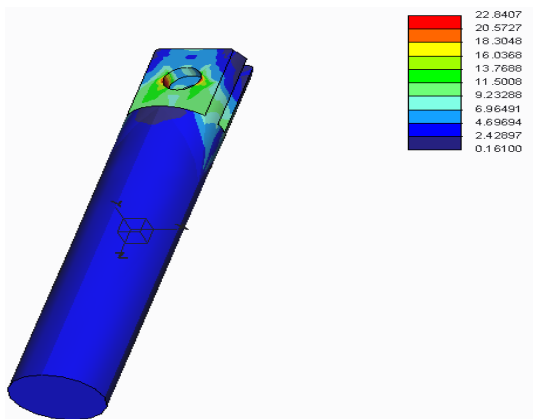


4.2 Analysis of components used in fabrication:

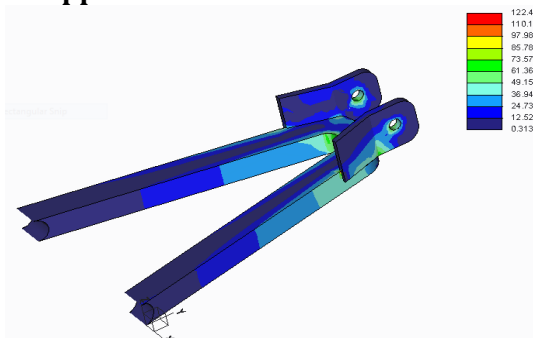
1.Wheel shaft:



2.Actuation rod:



3.Support link:



5.Conclusion: This mechanism is designed in order to reduce the physical efforts so applied by the rider. This mechanism is useful at heavy traffic jams, long signals, low speeds etc. This mechanism ensures the balancing of vehicle as well as safety of rider at the critical time. By developing this mechanism manual efforts are nullified.

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