

A Review Report On Tilting Wheel Mechanism

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Abstract: As we know that safety of the vehicle is the first and the foremost thing to be considered in 2-wheelers the safety of the vehicle from accident was understated on two major factors: Directional stability and the Aerodynamic force both are correlated to each other. The former is stability of a moving body or vehicle about an axis which is perpendicular to its direction of motion. Stability of a vehicle concerns itself with the tendency of a vehicle to return to its original direction in relation to the oncoming medium (water, air, road surface, etc.). The latter is the force exerted on a body by the air (or some other gas) in which the body is immersed, and is due to the relative motion between the body and the gas. Aerodynamic force arises from two causes: the normal force due to the pressure on the surface of the body and the shear force due to the viscosity of the gas, also known as skin friction. To be protected to the risk of injury the best solution is to fabricate the personal mobility which leads to the proper vehicle stability with its tilting wheel and cabinet cover body and also requires less traffic space as compared to the 4-wheelers with less fuel consumption.

Keyword: 2-Wheelers, Stability, Tilting Wheel, Aerodynamic Force, Fuel Consumption

Introduction

Increasing population and on trend urbanisation of the countries. The traffic conditions are bad and will be worst in the upcoming years. The big nasty part of our daily life is the commute and since the countries (like INDIA) are massively overcrowded and the vehicles are moving like molasses– they are just too big for the congested traffic.

For the individual who like to drive the vehicles without affecting the traffic one can choose the VIPRA Bike Tilting Wheel Mechanism which

inhibits the advantages of a 4 wheelers and eliminates the drawbacks of the 2 wheelers.

1. Initiation And Problem Formulation

According to Ali Behnood And Fred L Mannering Paper; A wide range of variables potentially affecting injury severities was considered including Driver - contributing factors, Location and Time of day, Crash-specific factors, Driver attributes, Road way characteristics, Environmental conditions, and Vehicle characteristics. To this they also considered the temporal stability behavior for individual parameters:

1. Driver's gender
2. Physical condition of the driver.
2. Driver attribute
3. Roadway characteristics
4. Environmental conditions
6. Vehicle characteristic
7. Type of the vehicles
8. Vehicle occupancy

With addition to these Aerodynamic Drag also plays an important role in vehicle stability. [1]

3. Proposed System

As the population increasing day by day; the number of 4-wheelers are also increasing out of which about 90% of that are only solo travelers; Firstly the idea is conceived that to reduce the usage of 4-wheelers by meanwhile using the 2 wheeler with more built-in function i.e. with greater comfort, better stability.

4. Various Subsystem Of Vipra Bike

4.1 DC Geared Motor

Gear motor is a combination of motor and gearbox. When users choose DC motor, they will find it

cannot reach their requirement because of high speed or low torque, so gear motor is their best choice. [2]

4.2 Battery

The lead–acid battery was invented in 1859 by French physicist Gaston Planté and is the oldest type of rechargeable battery. Despite having a very low energy-to-weight ratio and a low energy to- volume ratio, its ability to supply high surge currents means that the cells have a relatively large power-to-weight ratio. This feature, along with their low cost, makes it attractive for use in motor vehicles to provide the high current required by automobile starter motors. As they are inexpensive compared to newer technologies, lead–acid batteries are widely used even when surge current is not important and other designs could provide higher energy densities. [3]

4.3 Microcontroller

A microcontroller is a small computer (SoC) on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. Program memory in the form of Ferroelectric RAM, NOR flash or OTP ROM is also often included on chip, as well as a typically small amount of RAM. Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications consisting of various discrete chips. Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to digitally control even more devices and processes.[4]

5. Conclusion

With the growing need using 4-wheel cars as a personal mobility is the good option with many aspects such as for better comfort, to commute in bad environmental conditions, etc. , but on the cost of less efficiency about 50 % , double traffic space, rolling drag etc.,

Incase if we use the 4-wheeler with no rear seats as a personal mobility than also it just decreases the empty weight and production cost but then also no effect on the rolling drag nor on the traffic space requirements.

On the other hand if we choose two wheeler for the personal mobility than it would have less fuel

consumption and filter traffic easily, decreases rolling drag but it suffers with the bad aerodynamic, lack of comfort , less stability on slippery surfaces and slower speed , risk of injuries etc.,

The best solution for personal mobility is VIPRA BIKE which has advantages of both of car and bike and also special tilting wheel mechanism which stabilizes or control the vehicle at slippery surface and slower speed.

References

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