

DESIGN AND FABRICATION OF HYBRID TWO WHEELER

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Abstract— Since, old days we are using vehicle for transport and some personal use. It affect the environment by pollution by petrol, diesel. It get burn in engine for energy purpose but in certain unburned gases comes out, it affect the human being respiratory system. So, automobile industries introduced battery vehicle (hybrid vehicle) it consume zero emission and user friendly to environment. It came only in cars not in two wheelers, so for a change if we do hybrid two wheeler combined with engine and battery it has power, fuel-efficiency and less-emission.

We have power and eco-friendly by fixing both in the two wheeler while going in average speed of 0-50 consume more fuel because of high torque instead of power from engine it power from the battery above 50-100 engine comes to perform we have power from engine at that time low torque so bike wont consume high fuel means in traffic two wheeler goes on battery and in non-traffic in engine so low emission

I. INTRODUCTION

HISTORY

A bicycle, also called a cycle or bike, is a human-powered, pedal-driven[1-9], single-track vehicle, having two wheels attached to a frame, one behind the other. A bicycle rider is called a cyclist, or bicyclist. Bicycles were introduced in the late 19th century in Europe, and by the early 21st century, more than 1 billion have been produced worldwide. These numbers far exceed the number of cars, both in total and ranked by the number of individual models produced. They are the principal means of transportation in many regions[10-15]. They also provide a popular form of recreation, and have been adapted for use as children's toys, general fitness, military and police applications, courier services, bicycle racing and bicycle stunts.

An electric bicycle[16-21], also known as an e-bike or booster bike, is a bicycle with an integrated electric motor which can be used for propulsion. There are a great variety of e-bikes available worldwide, from e-bikes that

only have a small motor to assist the rider's pedal-power to somewhat more powerful e-bikes which tend closer to moped-style functionality: all, however, retain the ability to be pedalled by the rider and are therefore not electric motorcycles[22-29].

An electric bicycle[30-36], also known as an e-bike or booster bike, is a bicycle with an integrated electric motor which can be used for propulsion. There are a great variety of e-bikes available worldwide, from e-bikes that only have a small motor to assist the rider's pedal-power (i.e., pedelecs) to somewhat more powerful e-bikes which tend closer to moped-style functionality: all, however, retain the ability to be pedalled by the rider and are therefore not electric motorcycles[37-41]. E-bikes use rechargeable batteries and the lighter varieties can travel up to 25 to 32 km/h (16 to 20 mph), depending on the laws of the country in which they are sold, while the more high-powered varieties can often do more than 45 km/h (28 mph). In some markets, such as Germany, they are gaining in popularity and taking some market share away from conventional bicycles[42-49], while in others, such as China, they are replacing fossil fuel-powered mopeds and small motorcycles. E-bikes use rechargeable batteries and the lighter varieties can travel up to 25 to 32 km/h (16 to 20 mph), depending on the laws of the country in which they are sold, while the more high-powered varieties can often do in excess of 45 km/h (28 mph).

Depending on local laws, many e-bikes are legally classified as bicycles rather than mopeds or motorcycles, so they are not subject to the more stringent laws regarding their certification and operation, unlike the more powerful two-wheelers which are often classed as electric motorcycles. E-bikes can also be defined separately and treated as a specific vehicle type in many areas of legal jurisdiction[50-52].

II COMPONENTS AND DESCRIPTION

The components used are:

Two-wheeler (TVS jive)

Engine

ECU kit (remaped)

Battery 24V

Monster hub motor 24-125V

Wheels

Battery

The electrochemical cells that transform chemical energy into electricity are called as batteries.

Friction generator

When surfaces in contact move relative to each other, the friction between the two surfaces converts kinetic energy into thermal energy (that is, it converts work to heat). This property can have dramatic consequences, as illustrated using friction created by rubbing pieces of wood together to start a fire. Kinetic energy is converted to thermal energy whenever motion with friction occurs, for example when a viscous fluid is stirred. Another important consequence of many types of friction can be wear, which may lead to performance degradation or damage to components. Friction is a component of the science of tribology.

Friction is desirable and important in supplying traction to facilitate motion on land. Most land vehicles rely on friction for acceleration, deceleration and changing direction. Sudden reductions in traction can cause loss of control and accidents.

Friction is not itself a fundamental force. Dry friction arises from a combination of inter-surface adhesion, surface roughness, surface deformation, and surface contamination. The complexity of these interactions makes the calculation of friction from first principles impractical and necessitates the use of empirical methods

for analysis and the development of theory. Friction is a non-conservative force - work done against friction is path dependent. In the presence of friction, some energy is always lost in the form of heat. Thus mechanical energy is not conserved.

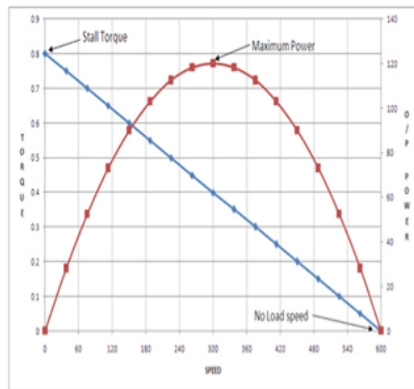
Hub motor

Hub motor electromagnetic fields are supplied to the stationary windings of the motor. The outer part of the motor follows, or tries to follow, those fields, turning the attached wheel. In a brushed motor, energy is transferred by brushes contacting the rotating shaft of the motor. Energy is transferred in a brushless motor electronically, eliminating physical contact between stationary and moving parts. Although brushless motor technology is more expensive, most are more efficient and longer-lasting than brushed motor systems.

A hub motor typically is designed in one of three configurations. Considered least practical is an axial-flux motor, where the stator windings are typically sandwiched between sets of magnets. The other two configurations are both radial designs with the motor magnets bonded to the rotor; in one, the inner rotation motor, the rotor sits inside the stator, as in a conventional motor. In the other, the outer-rotation motor, the rotor sits outside the stator and rotates around it. The application of hub motors in vehicular uses is still evolving, and neither configuration has become standard.

Electric motors have their greatest torque at start up, making them ideal for vehicles as they need the most torque at start up too. The idea of "revving up" so common with internal combustion engines is unnecessary with electric motors. Their greatest torque occurs as the rotor first begins to turn, which is why electric motors do not require a transmission. A gear-down arrangement may be needed, but unlike in a transmission normally paired with a combustion engine, no shifting is needed for electric

motors. Wheel hub motors are increasingly common on electric bikes and electric scooters in some parts of the world, especially Asia



With DC motors, torque is always maximum at zero speed which is called the stall torque. As you can see above, the motor's torque will drop in a linear fashion with speed/rpm. The theoretical power curve will be a parabola shape and peak somewhere in the middle. If you read my bike reviews, you'll know that I test and dyno the e-bikes when possible. Here's a plot of the Fat-E Mini below.

You can see that it resembles the theoretical plot quite well. There are some irregularities due to real world effects such as friction, efficiency and what not, but it seems fairly accurate. What's important to look at here is the area under the curve, not the peak torque or power. A car or mechanical enthusiast will always tell you that a machine.



Conclusion:

The research work of integrating the process of designing and manufacturing been under progress. The work will

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