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SINGAL WHEEL ELECTRIC BIKE

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Abstract

There are lot of brands of electric-bikes emerging locally. For using bike parameters such as a BLDC (Brushless DC) hub motor, lead acid battery pack , a controller, a light weight chassis and dynamo, switches. For generation purpose used as a dynamo. As that in a bike charging and discharging process at the same time in running. Dynamo as generating power stored in battery source. So average speed of the bike is simultaneously increases. The vehicle achieves average speed of 30-50 km/hr, range of 60 km/charge.

1.INTRODUCTION

Their have history of the electric vehicles as since early 20th century even before the IC engines came along . In recent years, the increased sensibility for environmental problems and the growth of carbon dioxide has brought greenhouse effects. People have been focused on the energy issues and promoted the use of less-polluting vehicles, such as electric Vehicles.

The Single wheel electric bike which are available and are affordable incorporates a rear wheel Brushless Direct Current motor. It is suitable and compact. A controller which controls the power transaction . The battery pack is a series combination of four cells. Traction battery is generally used lead acid which are cheaper as compared to other types. A potentiometer box is present which acts as accelerator along with other minor circuitry and accessories. With these specifications, Single wheel electric bike attend 30-50 km/hr speed and 50-60 km/charge range.

2 METHODOLOGY

In fig(1).shown a modified design of single wheel electric bike.The bike will have use 250W,48V BLDC rear wheel hub motor,driven by 48V battery set.The controller is a main part in this single wheel electric bike. Throttle is a potentiometer box, it act as a accelerator. For generation purpose used as a dynamo. Dynamo generating power stored in battery source. Motor is a device. This motor converts electrical energy into mechanical energy and generator converts the mechanical energy into electrical energy.But there are some devices which works as generator as well as motor. In our project, we have used the Brushless DC Motor. The charger used as a battery charging purpose. Display used in this project,for measuring the speed and how much charging of the battery.

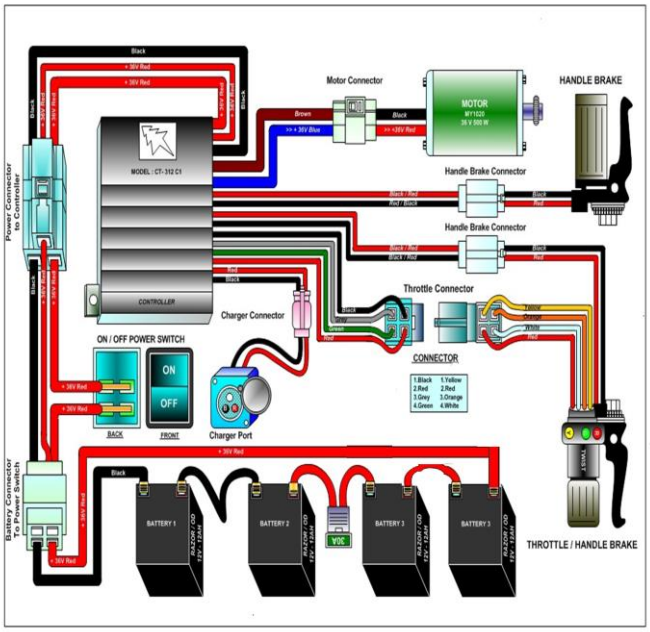

Fig -1: BLOCK DIAGRAM OF BIKE

2.2 Component

Table -1: component used in bike

Name	Quantity	Rating
CONTROLLER	1	bldc controller 48 V , 5-6 Amp
BLDC MOTOR	1	250 W, 48 V ,5-6 Amp 1500 rpm
BATTERY	4	sealed lead acid charging time 4 hours ,12V dc, 20 Ah.
DISPLAY	1	
INDICATOR	4	
HEAD LIGHT	1	
DYNAMO	1	12 v dc ,6 watt 1200 rpm

ARRANGEMENT OF MOTOR

The arrangement of motor is very important part of this project, because we have give the drive in wheel from

the rotor of motor. The motor is placed with the help of wheel. The size of motor is suitable for the wheel so that it does not create the problem for drive operation. The arrangement of is very systematic so that look of the bike becomes very good.While doing the all arrangement, we had not disturbed the original arrangement of bike, so that after designing the single wheel electric bike it will also runs as original bike

Fig -2: WHEEL STRUCTURE

ARRANGEMENT OF BATTERY

For proper working and long life of battery, it should be placed parallel to ground surface, so that in our project we have arranged the batteries with the help of bars. We had made a carriage downside the seat so that batteries should mount very well.

Fig -4 : BATTERIES CONNECTION

CONTROLLER

Regenerated braking will be incorporated into the motor controller circuit. Generally here the controller is supplying a voltage to the motor to drive it , and the motor is generating a back emf, proportional to its speed. If the motor goes faster, its back emf rises and the current (caused by the difference between the controller's output voltage and the motor's back emf) falls. If the motor speed very fast , then the current falls to zero, as back emf equals controller's output. It the motor goes even faster then the current must go negative (feeding back into the controller), as the back emf is now greater than the controller's output voltage. So braking starts to occur. The controller has to do something with this current. Crude designs simply dump it as resistive heating but it is more efficient (and not difficult) to feed the current back into the battery.

Fig -3: CONTROLLER CONNECTIONS

GENRATION

In this process dynamo are connected in bike wheel. Dynamo convert the mechanical energy into electrical energy. It's generate 12 volt DC supply

Fig -5: DYNAMO

3 TORQUE-SPEED CHARACTERISTICS

The torque parameters are used two, as to define a BLDC motor, peak torque (TP) and rated torque (TR). The motor can be loaded up to the rated torque during continuous operations. In the torque remains constant for a speed range up to the rated speed. The motor can be run up to the maximum speed, which can be up to 150% of the rated speed, but the torque starts dropping. torque curve. The motor can deliver a higher torque due to maximum up to peak torque, as long as it follows the speed.

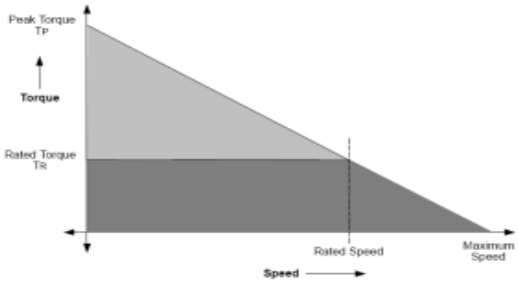

Fig -3: Speed torque characteristic

4 ADVANTAGES & DISADVANTAGES

4.1 ADVANTAGES

a) GOOD EFFICIENCY :-IC engines are 40% efficient than Brushless DC motors.The BLDC equipped in single wheel electric bike are above 90% efficient in power utilization. The motors are robust . As for use in all weather conditions with almost the all types of road conditions.

b) ECO-FRIENDLY :-If the electric power required to charge the batteries through the non conventional sources, then electric vehicles are very environment or Eco-friendly.

c)CHEAPER:-Due to good efficiency, electric units required to travel a given distance compared those with power requirement of fossil fuel is too less.

d)QUIETER JOURNEY:- Single wheel electric bikes are the quietest of all transport.

4.2 DISADVANTAGES

a) LOWER SPEED :- single wheel electric bikes don't attend the higher speeds which Diesel or petrol powered Vehicles easily do.

b) LONGER CHARGING TIME:-The batteries require of charging time about 6-8 hours. Even if we neglect the scarcity of charging stations, 6-8 hours is pretty long duration.

c) BATTERY ISSUES:-Especially lead acid batteries which degrade heavily over time (500-800 charge-discharge

cycles). So a bike with lead acid batteries will require replacement after about 2-3 years. The decomposition of batteries is not environmental friendly. The weight of batteries also adds to more than half the weight of the bike.

5. CONCLUSIONS

Electric vehicles offer a prominent future in transportation.This electric bike are newer in market and have started to gain attention of innovators and engineers.This project brought together several components and ideas to achieve a common goal to prove that it is possible to build a bike with to separate charging sources.

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