Replacement for Petrol Engine in Motorcycle-An Electrical Approach

Balaraj P
Dept., of EEE
PESITM, Shivamogga

Harshith D Raj
Dept., of EEE
PESITM, Shivamogga

Manoj G
Dept., of EEE
PESITM, Shivamogga

Srisham S M
Dept., of EEE
Pesitm, Shivamogga,

Kiran Kumar G R
Dept., of EEE
PESITM, Shivamogga

***Abstract*— In the current situation, we are worried about the rising demand of energy all over the world, which encourages us to change over renewable resource of energy. There are many ways to save the energy in various sectors. Here the proposed work mainly focuses on vehicle conversion, where the old fuel motorbike can be turned into electric bike, by replacing the petrol engine with electrical accessories. The use of electrical motor (BLDC motor) as a replacement for internal combustion engine, will also help in the reduction of pollution, as well economical, these bikes use chemical energy stored in the rechargeable battery packs.**

***Keywords*— BLDC Motor, Controller, Chain sprocket.**

I. INTRODUCTION

The reason of identifying the need to modify the Petrol engine vehicle is to overcome the problem of the contamination because of huge number of vehicles in metropolises. In April 2012 government of India has planned the roadmap for the expansion of the domestic electric vehicle in the nation. Electric vehicle consists of electric car, electric train, electric boats, electric aero plane, etc. Electric two-wheelers, as indicates itself, are electrically powered two-wheelers. A battery-operated motor is installed to store and change the electricity. A user control is usually attached to the handle bar to brake and adjust the speed. Battery operated motorbike means a vehicle modified for use upon roads and powered completely by an electric motor whose traction energy is provided fully by a power battery installed in the vehicle.

II. PROBLEM DEFINATION

In current situation, considering the current rate of fossil fuels usage, it will end up in next few decades only. Unpleasant climate change is a red alert for not to burn more fossil fuel anymore and especially the rate of petrol is increasing gradually on day to day. Also, the contamination due to vehicles in metropolises and city zones are posing the human life to risk. To overcome this, an effort is being made to find some alternative source of energy to drive petrol engine vehicle.

III. OBJECTIVE

The objectives of the proposed work are as follows:

1. To provide an alternate solution to fossil fuel dependent vehicles.
2. To reduce pollution caused due to petrol engine vehicle.
3. To minimize economic burden on common man.

IV. METHODOLOGY

several literatures were reviewed, to come up with the idea of replacing a petrol engine vehicle.

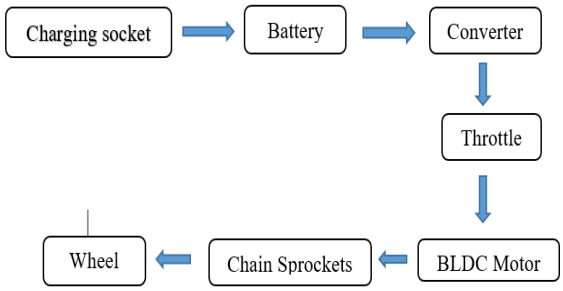

Fig.1.Proposed Block Diagram

The proposed methodology is, as shown in the form of block diagram in Fig.1, is described below.

Working principle: The principle on which it works is that the electromotive force of an AC motor receives electrical energy stored from the battery.

Operation:

Charging Socket: Firstly, the battery pack is charged with charging sockets, it will connect the vehicle to external source of supply, and it charges the battery. allocation of charging socket is based on the design of Electric vehicle.

Battery/Source: It supplies energy to the vehicle's electric motors and also functions as an electric storage system, storing energy in the form of direct current. The range depends on the kW of the battery. Battery operation

and life depends on the structure of the battery. The estimated life of a traction battery pack is thousands of kilometers.

Controller: Sometimes called a converter. It determines the operation of the tram. Simultaneously performs (electrical) power control from the battery to the electric motor. The throttle is adjusted by the pilot who sets the speed and frequency.

Throttle: An e-bike throttle works similar to a motorcycle. The throttle controls are usually found on the handlebar. To engage the throttle, you simply twist the handlebar, and the bike will accelerate and vice-versa.

BLDC Motor: Brushless DC motors are electronically rectified DCs. Brushless motor. Using a throttle, the controller supplies a current pulse to the motor windings to control the speed and torque of the motor.

Chain Sprocket: It is a wheel having teeth that holds the chain, which will be used to transmitting rotatory motion between the shafts. And it is differed from gear mechanism having many teeth.

Wheel: The wheel is connected with the Chain's pocket.as and when prime mover rotates, the chain on the shaft's tooth rotates, which applies mechanical force on the shaft to be driven, and then the wheel rotates.

V. EXPERIMENTAL SETUP

As described in the Fig.2. The proposed conversion procedure includes disassembling of parts like engine, Throttle, and the petrol tank which is kept original in order to see originality of vehicle. The bike engine is replaced with BLDC motor of rating 750W, 48V, 16.5A & 650 RPM, that is coupled with chain sprocket with help of Chain links. The motor is connected indirectly with throttle with the help of controller which will transmit to the motor.

To power a motor, a suitable battery pack is placed in the Bike. Battery is customized with the help of cells joined together in series, Motor and battery both are connected with a series of controller and electronic system that controls the power given to the motor forwarding speeds.

The battery used in this project work is Lead-acid type, the reason behind choosing this is to make our conversion economical because Lithium-ion costs Thousands of rupees, which can increase the budget of conversion approx. two times. This battery pack will include 4 units of 12V, 7Ah of each battery, by connecting these 4 units in series combination; we get 48V of required battery pack.

Fig.2. Proposed Frame of the Bike

VI. CONCLUSION

The proposed work mainly deals with converting a vehicle into electrical type, so we don't need any complex calculations as there are no major design changes in vehicle body constructions. So, the scrapped TVS Super excel (80cc) from garage is taken and fabricated the body according to motor design, then replaced ordinary throttle with e-throttle which is helpful for controlling purpose. This conversion not only helps in saving environment but also save the non-renewable resources. Our project, aim for converting a pre-existing vehicle, which results in reducing the economic burden as well.

REFERENCES

[1] Anna Joy, Aparna Jose, Jithin Joseph, Judson Fortel, Rini Varghese P, Arun Eldho, Assistant Professor, Dept.,. of EEE, Mar Baselios Institute of Technology and Science, Nellimattom, Kerala, India (2018) prosed "BLDC Motor Drive for Electric Vehicles"-IEEE.

[2] Arun Kumar Maurya Department of Electrical and Electronics Engineering, Ajay Kumar Garg Engineering College, 27 Kmstone, NH-24, Adhyatmik Nagar, Ghaziabad 201009 UP India proposed "Design and Fabrication of a Prototype Electric Vehicle".

[3] Pappuri Hazarathaiah, Y. Ashok Kumar Reddy, P. Vijaya Bhaskara Reddy, "Design and Fabrication of Hybrid Electric Bike" Department of Mechanical Engineering, N.B.K.R. Institute of Science and Technology, Vidyanagar, Andhra Pradesh, Pin code- 524 413 (2019).

[4] Kunjan Shinde, "Design and fabrication of electric bike", International Journal of Mechanical Engineering and Technology (IJMET)Volume 8, Issue 3, March 2017.

[5] Yashwant Sharma, Praveen Banker, Yogesh Raikwar, Yogita Chauhan, Madhvi Sharma, R&D ON ELECTRIC BIKE, International Research Journal of Engineering and Technology (IRJET) e- ISSN: 2395-0056 Volume: 05 Issue: 02 | Feb-2018 PISSN: 2395-0072.