

GENERATION OF MOTIVE POWER IN ELECTRIC VEHICLE

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College : Jawaharlal Nehru New College Of Engineering, Shivamogga
Branch : Department of Electrical and Electronics Engineering
Guide(s) : Prof. Veerasha K B
Dr. Thejaswi A H
Student(S) : Mr. Muralidhar S T
Mr. Gagan S V
Mr. Sanketh G R
Mr. Sheik Fahad

Introduction:

Electric vehicle (EV) technology has the potential to reduce emissions and overall global petroleum consumption if it uses grid electricity. A plug-in electric vehicle (PEV) has the facility to plug into a domestic/industrial electric outlet, thereby reducing a significant portion of transportation petroleum consumption. A unique advantage of plug-in electric vehicles is their capability to integrate the transportation sector and the electric power generation sector to improve the efficiency, fuel economy, and reliability of both systems. Implementation of plug-in hybrid concept to two-wheelers offers greater flexibility and better utilization of resources.

In addition, the fuel/energy consumption depends greatly on the driving cycle over which the vehicle operates, but more important is the electric range. Grid services help utilities resolve issues of reliability and stability. PEV can be used to take excess energy during the times of overgeneration.

Objectives:

- To develop a regenerating power system. This generates a certain amount of power which is fed back to battery.
- The alternator is coupled with a Hub of the motor, which helps to recharge battery while vehicle is moving.
- To propose and develop a simple control strategy for the plug-in electric two-wheeler suitable for city driving conditions.
- To develop a plug-in electric two-wheeler by converting available conventional two-wheeler with a suitable motor and battery.

Methodology :

In this project, the BLDC motor was connected to gear wheel through chain drive, which is fitted using nut and bolts on iron strips welded to seat stay. Here two batteries are used: the Primary battery of 48V 25Ah lithium-ion battery, and the secondary battery of Four 12 V 7.2Ah Lead-acid battery which is a battery bank. Here we have used 12V Alternator which is used to generate energy and that generated energy is fed back to the Secondary battery bank. The alternator is coupled to the motor through the belt drive and we use the chain drive from motor to wheel. A controller is a component that connects all electrical parts on the bike together. The controller consists of various sensors for keeping a check on

Speed moments. The controller work with a closed-loop speed control mechanism for precise control over the E-bike adjusting the speed.

The fabrication was carried out keeping in mind the maximum load the motor that it can withstand. Edge grinding was done to provide smoother surface finishing on freewheel and iron strips. All the fabricated parts were assembled. The throttle is powered by battery which are fitted on the handle.

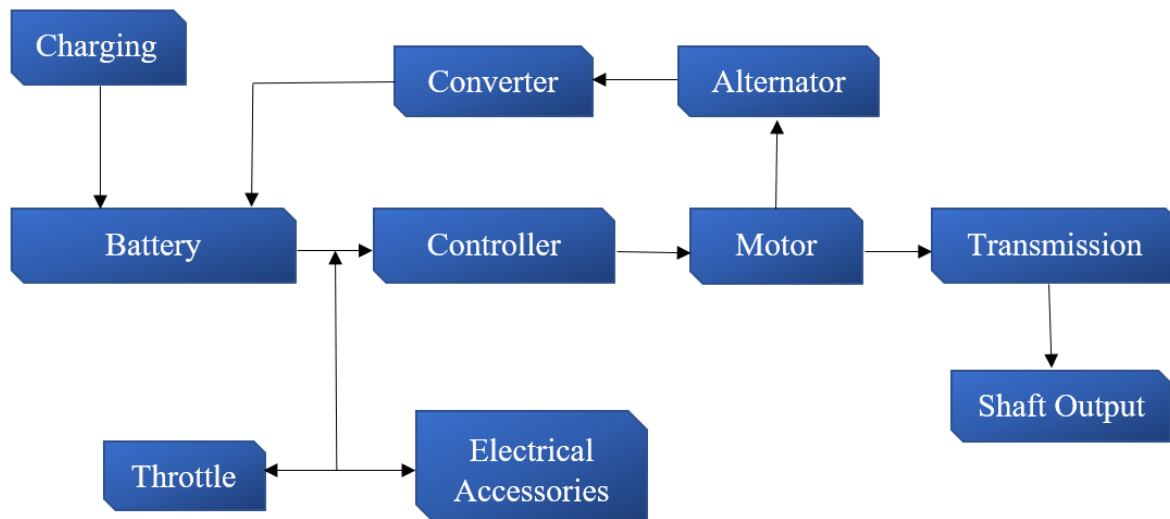


Fig 1: Block diagram

Result & conclusion:

- In our project, E-bike had the range of covering 70 Kms per one complete charge. By adding the secondary battery with Regenerative System, it is possible to extend the range by 15 – 20 Kms per charge.
- Electric vehicle contributes to cleaner air.
- It also improves the distance covered in a one single charge.
- It is eco-friendly and the dependency on the fossil fuel can be reduced.

Scope for future work:

- Automobile Industry is switching towards the electrification of vehicles. This trend is growing rapidly in nowadays, by the year 2028, 90% of the vehicles around the world will be replaced by electric vehicles.
- To cope with this growth in the automobile industry, the proposed project gives a wide range of opportunities in various areas for future development, such as range extension of any electric vehicle in a very efficient way.
- The performance of the vehicle can be improved by using different driving modes, charging time can be reduced significantly with the help of advanced electronics equipment and overall maintenance cost of the vehicle can be reduced to minimum.