

POWER PRODUCTION IN ELECTRIC VEHICLE USING SELF GENERATION AND REGENERATION

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ABSTRACT

Transportation accounts for concerning simple fraction of world energy use, and traveler vehicles account for concerning tenth part of energy-related CO₂ emissions. throughout the previous few decades, environmental impact of the petroleum-based transportation infrastructure, together with the worry of peak oil, has junction rectifier to revived interest in an electrical transportation infrastructure. EVs dissent from fossil fuel-powered vehicles therein the electricity they consume may be generated from a large vary of sources, like periodic event power, alternative energy, and wind generation or any combination of these. The electricity might then be hold on on board the vehicle employing a battery, flywheel, or super capacitors. EVs embody road and rail vehicles, surface and underwater vessels, electrical craft and electric satellite. Because it is well-known one in every of the drawbacks of the electrical vehicles is that the practice range. The practice range may be redoubled with the assistance of self-generation and regeneration operation. Regenerative braking system replaces the standard braking system in cars that produces a lot of heat throughout braking. This method ensures high capability of energy storage in braking conditions and under neath traditional operation.

KEYWORDS: Petroleum-Based Transportation Infrastructure, Assistance of Self-Generation

Article History

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INTRODUCTION

There are a spread of fresh vehicle technologies and fuels in development and in use, however electrical vehicles represent one in every of the foremost promising technologies for reducing oil use and cutting emissions. The invention of electrical vehicle (EV) could be a miracle, because it turns out zero emission to the air which implies there are not any harmful gasses un harness from the automotive that causes the layer contaminated. Nowadays, the population of work unit starts increasing in step with the demand within the market. In twentieth century, conveyance technology like management technology and integrative technology are developing sharply. Somehow, the limitation of driving mileage still becomes associate obstacle for the event of electrical vehicles. This downside had been tackle by victimization regeneration; it's become one in every of the ways that to enhance the practice range as this methodology will increase an

EV's driving range by 8-25%. Once the automotive starts moving then generation takes place. The generator connected to the wheels starts generation. This method is termed as self generation. During this project the facility maybe generated with the assistance of regenerative braking system. The RBS system converts the energy into power throughout braking operation. In cars whenever the brakes are applied the vehicle involves a halt and K.E. gets wasted because of friction within the kind of kinetic energy. Victimization regenerative braking system in cars alters United States of America to recover the K.E. of the vehicle to some extent that's lost throughout braking method. The energy management is often well improved through self generation and regeneration. Therefore the generated energy are often keep back within the battery and also the stored energy can be used additional. During this model the generated energy are often keep with the assistance of advanced technology like immoderate condenser.

SELFGENERATION

The electric vehicle is driven by the battery. On change the automotive the motor takes current from the battery. The motor converts the power into mechanical rotation and therefore the vehicle moves forward once the automotive starts running then generation takes place. The synchronous generator connected to the wheels starts generation. Here synchronous generator has been used as a result of it will operate at low power. Once the driving speed of the automotive will increase then generation additionally increases. Therefore the generation depends upon the driving condition. The output of the generator is Alternating sort. Therefore it is often reborn into DC with assistance rectifier circuit. The rectifier circuit converts this electrical energy into beating DC. The beating DC part is competent the filter circuit that removes harmonics. Then the DC is keep within the immoderate condenser. Therefore the facility are often generated with none external forces and this method is termed self generation.

REGENERATION

The brake could be a device that decelerates the moving object or prevents associate object from fast. Brakes use friction to convert K.E. into heat. Because the constraints rub against the wheels excessive heat is generated. This heat dissipates into the air wasting up to thirtieth of the generated power. Regenerative braking technology captures the energy created by braking method back to the system within the kind of charging the battery for additional use.

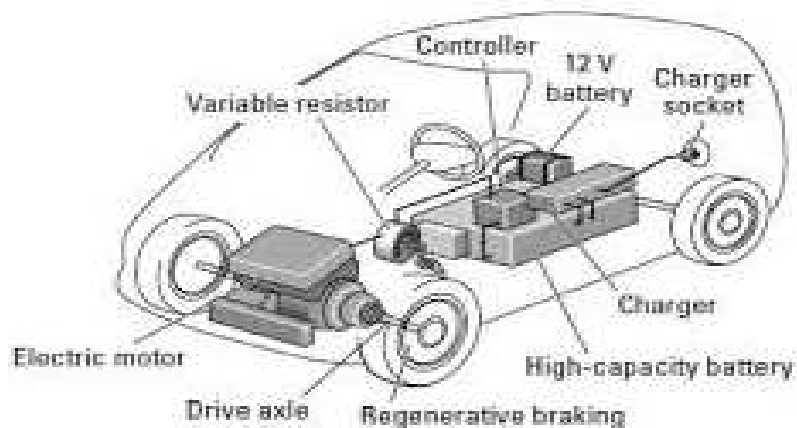


Figure 1

Regeneration in EV

The energy generated throughout braking depends on the driving system. once the driving force steps on the foot pedal of an electrical or hybrid vehicle, the brakes place the vehicle's motor into reverse mode, inflicting it to run backwards, so as to slow the car's wheels. Once the wheel runs backwards, then the motor acts as an electrical generator, manufacturing electricity that is then hold on the back to the vehicle's batteries. Many trendy hybrid and electrical vehicles use this method to increase the vary of the battery pack. In regenerative braking system the controller plays an important role as a result of it controls the method of the motor. The most purpose of the controller is to observe the speed of the wheel, calculate the force, and the generated electricity to be fed back to the batteries. Underneath braking condition the controller directs the present generated directly into the batteries or capacitors.

STORAGE

The energy are often generated victimization self generation and regeneration principle and each the strategies doesn't turn out any pollution to the system. Victimization these systems the practice range of the vehicle are often improved. The energy storage also can be through with the assistance of Hybrid Energy Storage system. This methodology will improve the battery lifetime of the system. It's conjointly doable to spice up the potency if the system is correctly sized and controlled. Future work associated with this paper can specialize in analyzing the system underneath high voltage conditions.

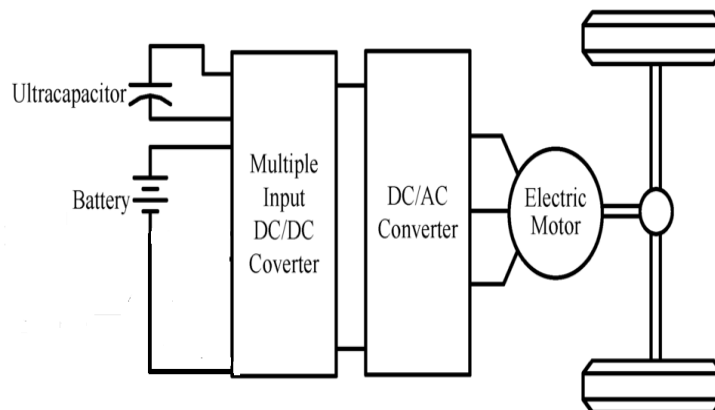


Figure 2: Hybrid Energy Storage System

According to our scheme when we charge many batteries in final that all to be connected together, which is not at all possible because of difference in voltage levels. To avoid this problem, we need to have a DC-DC converter whose output is designed for 24 Volts, where the Input designs should be according to the battery source. All the DC-DC converter output, should be connected together, sum of the output will have good enough current with constant voltage (SMPS concepts) (switched mode power) system.

The sum output should be connected to PWM chopper based inverter to invert to A.C. The A.C output should be designed according to the bus voltage of the electricity board. This system may provide constant and consistent output to the electricity board grid, irrespective of the climatically condition. During cloudy atmosphere also, we may receive energy. So this is the real enhancement which is needed for globalization of electrical output and may contribute the power to the power sector which needs energy.

BLOCK DIAGRAM

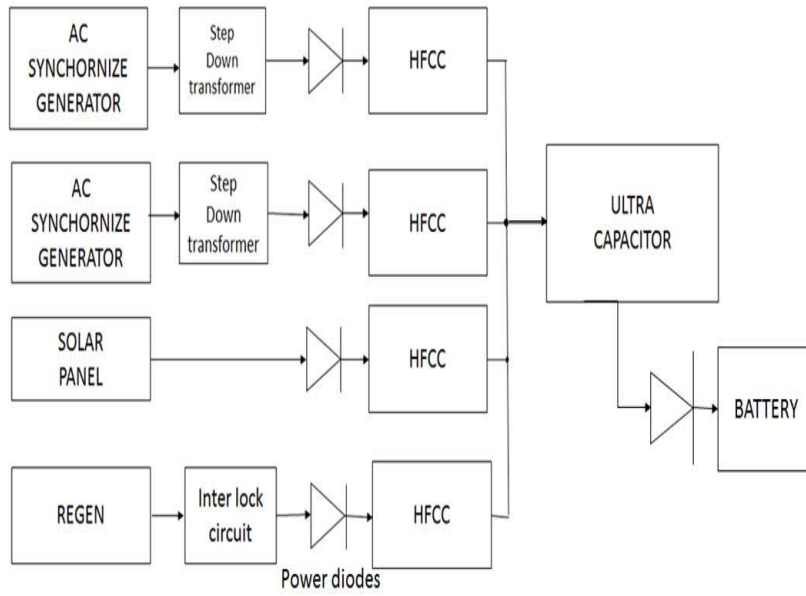


Figure 3

HARDWARE IMPLEMENTATION



Figure 4: Hardware Picture

OUTPUT OBTAINED

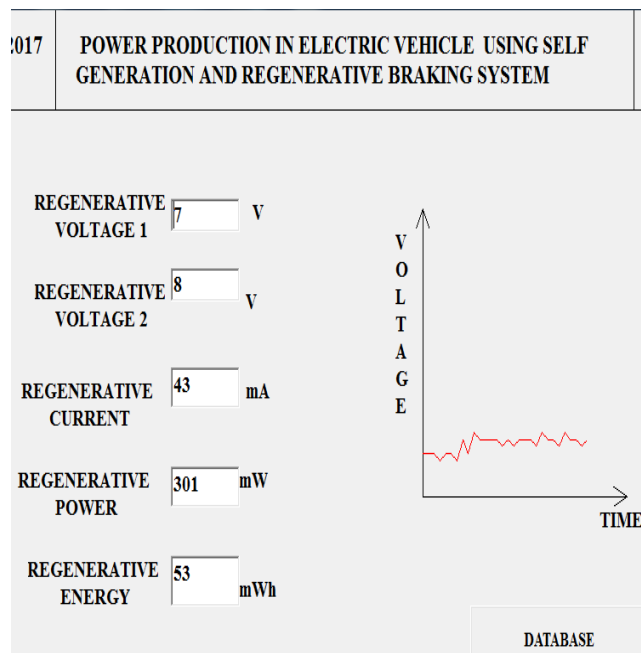


Figure 5 Output of Regenerative Voltage

RESULTS

Regenerative braking is one in every of the vital systems in electrical vehicle as a result of it's the flexibility to save lots of the waste energy up to 8-5%. The regenerative braking system has been improved by the advanced power electronic element like ultra capacitor, DC-DC device (Buck-Boost) and regulator. The ultra capacitor that helps in rising the transient state of the automotive throughout beginning, offer a sander charging characteristic for the battery and maximize the general performance of the electrical vehicle system. The Buck-Boost device helps maintaining the facility management within the regenerative braking system like boosting the acceleration. Finally, the regulator is employed to reinforce the facility recovery method through the wheel of the automotive. In conclusion, the regenerative braking could be a tremendous construct that has been developed by Engineers. Within the close to future, regenerative braking techniques may be additional developed by mistreatment completely different strategies either by fuzzy controller or inflammatory disease controller.

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