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HYBRIDTWO-WHEELER USING DUAL BATTERY POWER

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Abstract
Today there is a much more gap between the demand and the supply of energy. The demand for rate of energy is going on increasing and the energy sources are going to subtract at a faster rate. So there is a need to recover this gap by using the non-conventional energy sources such as using generator and solar energy. These two types of the sources are available in an abundant form and also eco-friendly. When the fuel is empty in the vehicle, the energy can be generated by using the two renewable energy sources as rotary and solar energy. In our project the energy generated by the two power will be stored in battery. This energy is used to drive the vehicle. The rotary energy is obtained with respect to speed of the vehicle is always similar to the running speed of the vehicle. Rotary energy is obtained from placing a generator to obtain power from chain drive and wheel rotation on two wheelers it is possible to achieve higher rate of energy generation. The feasibility of the technology can be done with the dual battery, charging and discharging done simultaneously using cut-off valve.

1.0 Introduction

Hybridization is one of the of way approach to achieve better fuel economy in automobiles. Hybrid electric vehicle (HEV) technology has the potential to reduce urban emissions and overall petroleum consumption, if it uses grid electricity. A plug-in hybrid electric vehicle (PHEV) has the facility to plug-in to a domestic/industrial electric outlet, thereby reducing a significant portion of transportation petroleum consumption. In addition, the fuel/energy consumption depends greatly on the driving cycle over which the vehicle operates, but more important is the all-electric range. The characteristics of the battery also play a vital role in choosing the type of traction battery available in the market.

The main objective of this project is to implement the plug-in hybrid technology concept for two-wheeler by proposing a control strategy and to demonstrate the benefits of all-electric range and fuel economy improvements. The work also focuses on the investigation to evaluate the energy requirements, its mass and initial cost of the battery pack for daily average travel needs of plug-in hybrid electric two-wheelers in India. This study also investigated the influence of driving cycle and all-electric range on battery parameters for three different battery types and driving cycles. The objective also focuses on the assessment of annual gasoline/petrol saving and there by carbon dioxide emission reduction from the two-wheeler segment in India for the next decade. The following section gives the objectives of this work in detail.

The EU-funded research project Composite Structural Power Storage for Hybrid bike (Storage) was set up to develop new concepts for lightweight energy storage to radically improve the efficiency of hybrid vehicles by using parts of a car's structure as power sources.

1.1 Batteries for EV & HEV

Pesaran et al (2009) projected that Plug –In Hybrid Electric Vehicles (PHEV) had potential over conventional vehicles in next ten to twenty years. However, he claimed that main barriers for the commercialization of PHEVs were the cost, safety, and life of batteries. This paper analysed the process for defining vehicle platforms, vehicles performance target, the desired equivalent electric range operating strategy, and the state of charge. The paper presented assumptions, analysis, discussions, and the resulting requirements adapted by U.S. Advanced Battery Consortium (USABC).

Burke, (2007) explained the application of batteries and ultra capacitors in electric energy storage units for electric vehicles and charge sustaining, plug – in hybrid electric vehicles in details, in this paper. The study was focused on lithium-ion batteries and carbon/carbon ultra capacitors. The energy density and power density characteristics of battery and ultra capacitor technologies are discussed.

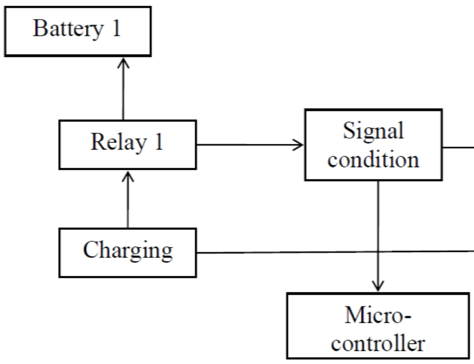

Figure 1.1 Relay cut of control

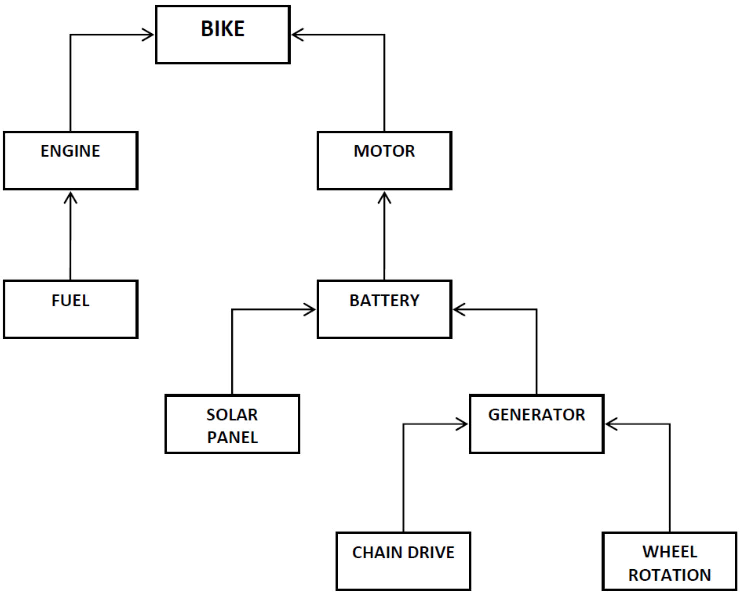

Figure 1.2 Schematic Diagram

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1.2 Circuit Operations

The electricity produced from the dynamo and the generator comes to the relay driver circuit. The relay driver circuit splits the current and sends it to the battery which is not in use. Relays are used where it is necessary to control a circuit by a separate low power signal, or where several circuits must be controlled by one signal. We used two LED bulbs to show which battery is charging. The micro controller determines the battery which is empty and diverts the current to it. A micro controller is a small computer on a single integrated circuit used for performing programmed operations. The LCD display shows the status of the two batteries and also the one which is charging and discharging. A Liquid Crystal Display (LCD) is a flat panel display that uses the light modulating properties of liquid crystals. We are using a separate AC supply to power the LCD display. It is because the current produced from the generator is not constant and when it is supplied to the LCD display it may damage it. The circuit board is used to hold all these above said devices. Circuit board is a plastic board which is used to mechanically support and electrically connect electronic components together.

1.3 Circuit Diagram

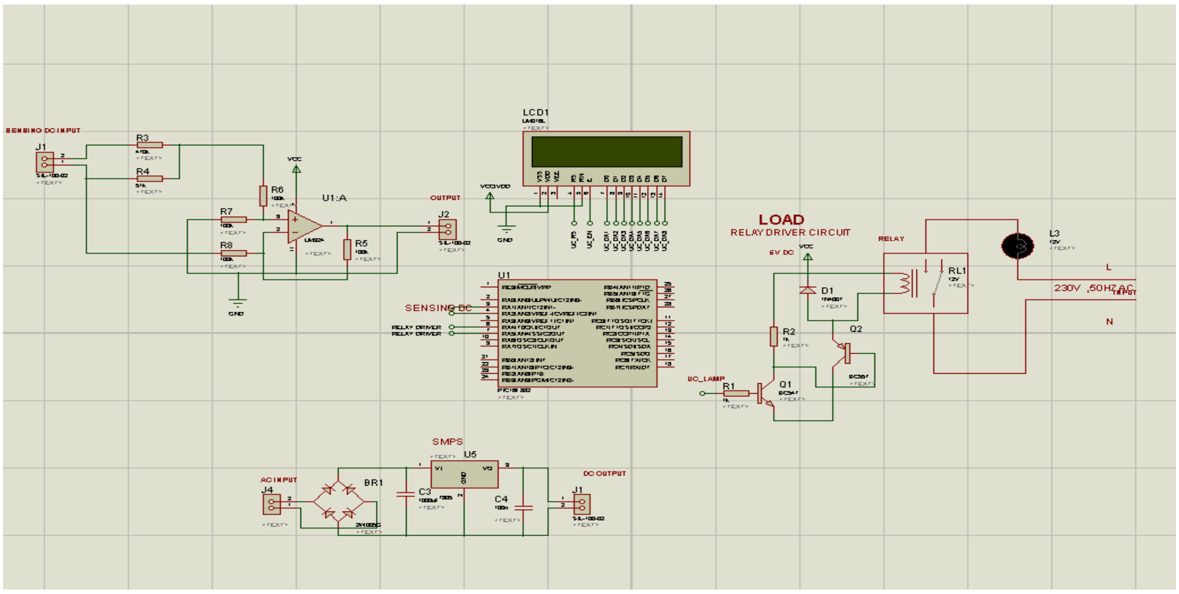

Figure 1.3 Schematic Diagram

1.4 Photographs

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Figure 1.4 Experimental Setup

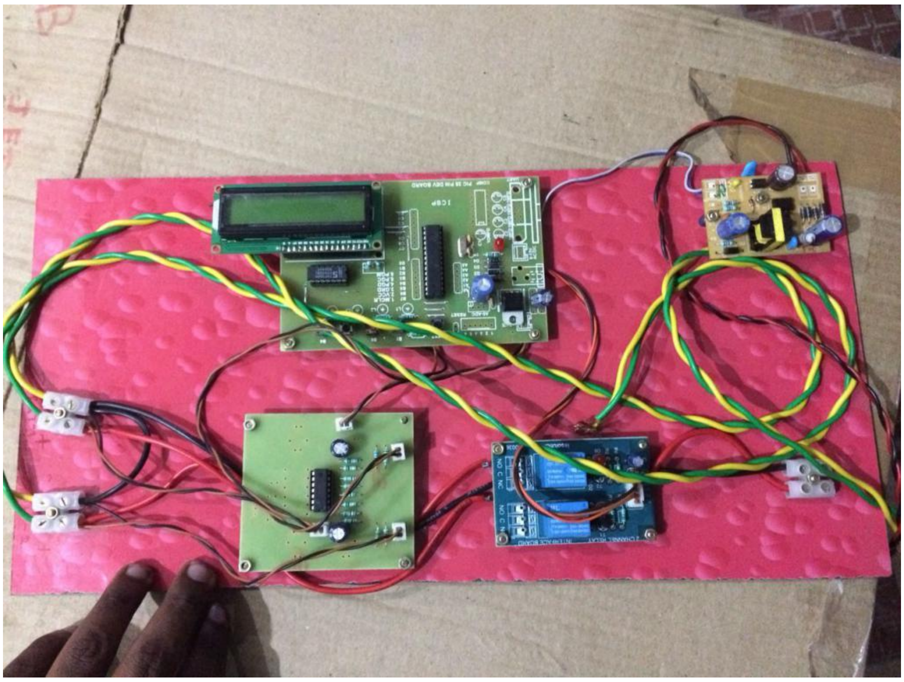

Figure 1.5 Circuit Board

1.5 Results and Conclusions

The time shift between the load power profiles is a consequence of the limited rise time for the current drawn / supplied by the Dygatron converter. Moreover, the current direction cannot be altered instantaneously, resulting in a short period of zero current during each transition from acceleration to regenerative braking.

The difference in magnitude of the load power during high currents, for example during the period t=120 to 140 s, has two reasons. Firstly, the calibration of the current measurements in the Size I system is made using relatively low currents and having the Dygatron converter as reference. This might cause inaccuracies in the current measurements, together with possible interference from strong electro magnetic fields during the test. The current measurement system is re-calibrated before the Size II system is built. Secondly, the battery model used in the simulations does not include the temporary decrease of VOC associated to high battery currents. The difference is not significant in the tests performed within this project, but during longer tests, this must be accounted for.

The loss function used for the DC/DC converter is merely an estimation of the actual losses in the real system, causing additional inaccuracies in the simulations. Compared to the results from the experiments of Size I, the over all efficiency of the Size II system is, as expected, increased due to the higher voltage levels, which decrease the relative system losses. In addition, the battery losses is further reduced in the Size II system, since the relation between the battery and the EC capacity is more in accordance with the reasoning in section II E. It is possible that the performance of a real battery-EC system is further enhanced, since the necessary cooling of the batteries is decreased when the maximum battery power is decreased. Moreover, the total efficiency of the energy storage system could possibly be improved, compared to a conventional battery system, when the internal losses associated with large battery power are reduced. This could compensate for the added losses in the

DC/DC converter and the EC bank.The generation of power from, Solar energy when engine runs, The motor will work as generator,From wheel rotation with the help of DC generator.

1.6 Conclusion

In this paper we have successfully fabricated a hybrid vehicle powered by dual battery system. Thus the eco-friendly power generation method can be implemented for domestic and commercial use at an affordable cost. The efficiency of the engine will not be affected because only the rotary motion of the chain drive is used to drive the dynamo. The main objective of this paper is to recover the useful solar energy and to convert the recovered rotary motion to useful electric energy. This objective has been successfully accomplished in this paper. The energy produced from this system could be used to power any auxiliary devices in an automobile directly or it could be stored in a battery and then used later. The new dual battery concept is more efficient than the one present in hybrid vehicles and four wheelers.

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