

## SELF CHARGING ELECTRIC VEHICLE

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### Abstract

In this 21st (twenty-first) century conservation of power is the most compulsory phase of the society and as automobile is a paramount phase of society in day to day life, subsequently the conservation of power as properly as pollution due to the utilization of Bio-fuels in vehicle quarter is a difficult job. So strength conservation and pollution free conveyance grew to be most paramount factor. To resolve this trouble the thought of Electric Conveyance (EV) (electricity powered automobile) machine was once introduced, this can be utilized in all kind of automobiles such as cars, bus, truck etc. But as soon as the battery of EV is charged it peregrinates a inhibited distance, once more we have to cost the battery of conveyance, which is a time eating process.. In this paper we worked on this issue of electrical Vehicle (EV). We resolved this by doing parallel operation of battery with self-generation. This will helps to improve the distance covering rang of electrical vehicle (EV) and make it more efficient. It will save the lot of time which is needed to charge the electric vehicle (EV).

**Keywords:** Self-Charging, Parallel battery, Alternator, Photovoltaic

### I. INTRODUCTION

Electrical vehicle (EV) based on electric propulsion system. No internal combustion engine is used. All the power is based on electric power as the energy source. Electrical vehicle (EV) users many have provided incentive like lower tax or free parking etc. But in underdeveloped countries and developing countries still don't have that much charging facilities for Electrical vehicle (EV) and if have then they are too far from each other. So to recharge the Electrical vehicle (EV) at the time of long distance traveling is the biggest issue. This paper is on how to overcome this issue of electrical vehicle (EV)? We can resolve this issue by using the combination of self- generation and parallel battery operation in electrical vehicle (EV). But according to the thermodynamics law and many other laws we cannot achieve 100% of energy from one source to another and it is theoretically impossible, so all we can improve efficiency and that's the main point of this project.

### II. LITERATURE SURVEY

1. A self-charging electric vehicle which generates the electric power required to drive the vehicle during the running condition by the means of two auxiliary power source. One power source is dynamo which is

directly coupled with driving motor and second one is solar panel (Photovoltaic) placed on the top of the car. The power source are managed by the means of a current regulator for a charging the battery simultaneously.

2. A Comprehensive Study of Key Electric Vehicle (EV) Components, Technologies, Challenges, Impacts, and Future Direction of Development”. This paper is focused on reviewing all the useful data available on EV configurations, battery energy sources, electrical machines, charging techniques, optimization techniques, impacts, trends, and possible directions of future developments. Its objective is to provide an overall picture of the current EV technology and ways of future development to assist in future researches in this sector.

3. Battery Electric Vehicles Performance, CO<sub>2</sub> Emissions, Lifecycle Costs and Advanced Battery Technology Development”. The emissions of CO<sub>2</sub> caused by the transport sector can be reduced by the battery electric Vehicle. The well-to-wheel CO<sub>2</sub> emissions are reduced by approximately 50% compared to a similar internal combustion engine vehicle. All the researched battery electric vehicles in this thesis have lower CO<sub>2</sub> emissions than the ICE vehicles when the electricity comes from the European mix. The Smart For two emits 62 g/km, where the Smart for two petrol emits 121 g/km. The Ford Focus petrol emits 187 g/km, the highest of all the vehicles researched in this.

### III. BLOCK DIAGRAM

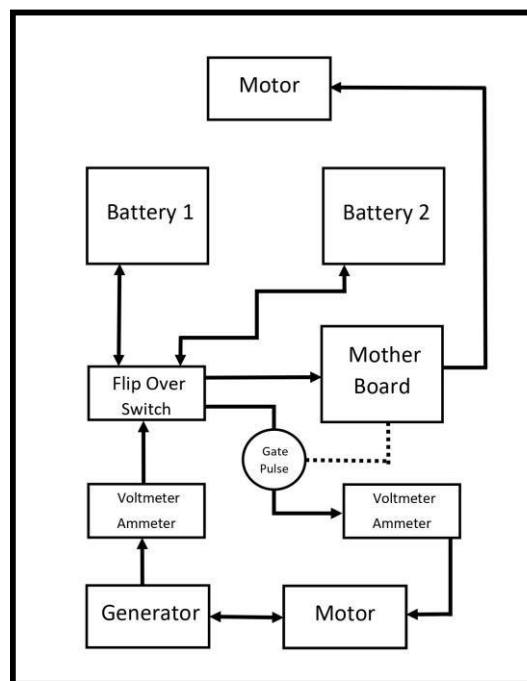


Fig. 1 Block Diagram

### IV. PROBLEM IDENTIFICATION

The conventional vehicles use fossil fuels like petrol and diesels etc. As main fuels for energy source. These fuels cause heavy damage to our environment by the emission of harmful gasses like CO (carbon monoxide), Hydrocarbons etc. and the conventional fuels are the limited and non-renewable sources of energy so if they ones get totally utilized then we will get dependent no renewable energy sources like solar energy, wind energy, hydro energy, tidal energy etc.

We can overcome this by using battery electric vehicles. Here battery is used as energy source for vehicles. One problem is there when battery is discharged it requires much time to charge again.

If we add a self-charging circuit arrangement in the electric vehicle, then the charging time can be reduced. It can be done using dynamo, alternators, dc to dc step-up circuit, charging circuit, alternate batteries etc.

**v. CIRCUIT DIAGRAM**

Here we used 2 batteries connected parallel in circuit by using 2 flip over switches. Alternator and motor is coupled to each other. The voltmeter and ammeter is connected across and in series with it respectively. Diodes are attached to at the alternators side to prevent it from reveres current. 2 SCRs are used at the side of main motor to control its rotation remotely by giving gate pulse to it. We are using a mother board and its controller to control the prototype model remotely. The whole system is powered by 2 battery of 12V DC, 4amp. One of them is used to run the system and other one get recharged and vice versa. We can flip the battery contacts by using change over switch which is attached between alternator and main motor.

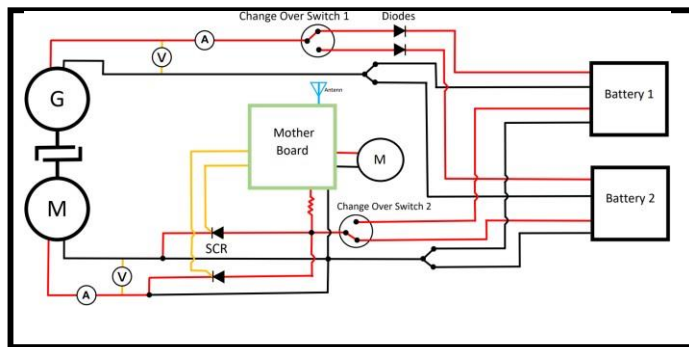
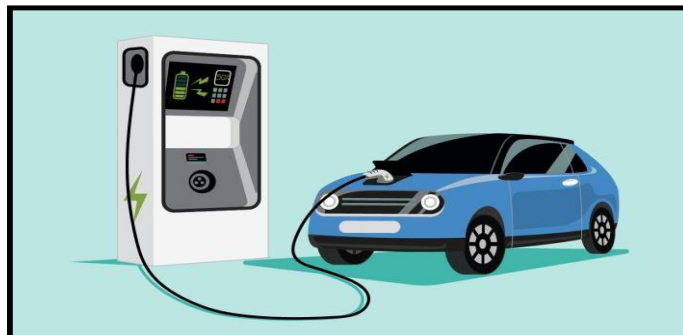


Fig. 2 Circuit Diagram

**VI.METHODOLOGY**

We have built a working prototype model of electric vehicle (EV) for this experiment. The arrangement is simple the alternator and driver motor is connected by a shaft parallel so that when wheel starts rotating the alternator will also start rotating with same speed as motor shaft speed due installation of reduction gear box. The block diagram of complete arrangement is shown in figure No.1 above.



**The Working of change over switch for Battery Switching Case 1-**

When switch 1 ON and switch 2 will keep OFF, the car will run with help of battery no.1 and battery no. 2 will be charging.

**Case 2-**

When switch 1 is OFF and switch 2 will kept ON, the car will run with help of battery no.2 and battery no. 1 will be charging.

And this process will be perpetuated vice-versa to run the electrical vehicle (EV) further range without charging from external source.

**VII. COMPONENTS DESCRIPTION**

- 1) **Alternator** – Alternator is device which converts mechanical energy into electrical energy. (12V DC / 2 amps)
- 2) **Motor** - Motor is device which converts electrical energy into mechanical energy. (775 - 12V DC / 13000rpm)
- 3) **lithium ion battery (LI)** – Lithium ion battery is a lightweight high power battery. (single cell - 3.5V DC)
- 4) **Shaft** – It is a metal rod which connects rear wheels. (diameter – 4.2mm / length – 15.6cm)
- 5) **Change over switch** – It is a switch having one input and two output. It is used to flip the contacts of batteries and motor.
- 6) **Controlling kit** – It is a set of remote control and receiving board. It is used to control our devices remotely.
- 7) **SCR** - A silicon controlled rectifier (SCR) is a four- layer solid state current controlling device with 3 terminals. They have anode and cathode terminals like a conventional diode and a third control terminal, referred to as the Gate.
- 8) **Diode** - A diode is a semiconductor device that acts as a one-way switch and block the current from one side. It allows current to flow easily in one direction, but severely restricts current from flowing in the opposite direction.
- 9) **Voltmeter** - A voltmeter is an instrument used for measuring electric potential difference between two points in an electric circuit. It is connected in parallel.
1. **Ammeter** – Ammeter (abbreviation of Ampere meter) is device which is used to measure the current in a circuit. Electric currents are measured in amperes (A).

**FUTURE SCOPE**

1. Price of electricity as fuel could fall as low as Rs 1.1/km, helping an electric vehicle owner save up to Rs. 20,000 for every 5,000km traversed.
2. Can add solar panels at the top of vehicle to compensate the losses and increase the efficiency.
3. Finally, electrification will help reduce vehicular emissions, a key contributor to air pollution which causes average 3% GDP loss every year.
4. Can add a battery to store the power generated and use it whenever required by our sources.

**VIII. RESULT**

In put given to motor: -

Voltage	Current	Wheel rpm
12V DC	1.7amp	110rpm

Output generated from DC Generator:-

Voltage	Current	Generators rpm
10V DC	1.1amp	110rpm



**ADVANTAGES**

1. Better Mobility
2. Driving fuel-based automobiles can burn a gap in your pocket as cost of fossil fuel have gone all time high.
3. It will save the fossil fuels like petrol, cole, diesel, etc.
4. It will create pollution free environment.
5. It will increase the distance covering range of electrical vehicle (EV) near about 3 times.
6. It will solve the biggest problem of electrical vehicle (EV) which is frequent charging.

**CONCLUTION**

In this paper we have worked on a parallel battery operated electric vehicle car prototype. We created this car according to our setups explained above. The speed of motor was as per our requirement but the current generation was quite less. Due to less generated current the charging time was more. But due to presence of secondary battery which was charged by self-charging circuit the vehicle can cover more distance and the rider cannot wait until the battery to be charged. Further the current can be increased to reduce the charging time of batteries.



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