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Hybrid Electric Vehicle

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Abstract: *In our project we are using hybrid technology as electrical energy. The electrical Power will be generated by using generator and solar plate. B This generated energy stored in a battery and then fed to the DC motor.*
One DPDT switch is also employed to alter the charging battery and sourcing battery, because of this DPDT at a time one battery source the power while another battery remains in charging mode .To increase the power of the generator two generator is connected in series and the output of it fed to the booster circuit. Booster circuit enhance the voltage at certain level to charge the battery. Here also diode is used to prevent reverse voltage.
Mean while petroleum consumption rate in the emerging economics are rapidly expanding. Petroleum sources are limited. Today's nearly 60% of petroleum consumption is dedicated to transportation by means of IC engine vehicles which emits CO & CO2 gas and polluted the environment. The hybrid electric vehicle technology hold much promises for reducing the demand for petroleum in transportation sector. Our day to day life fuel storages are declining continuously therefore cost of fuel is increasing. By using hybrid vehicle we are saving the fossil fuel.

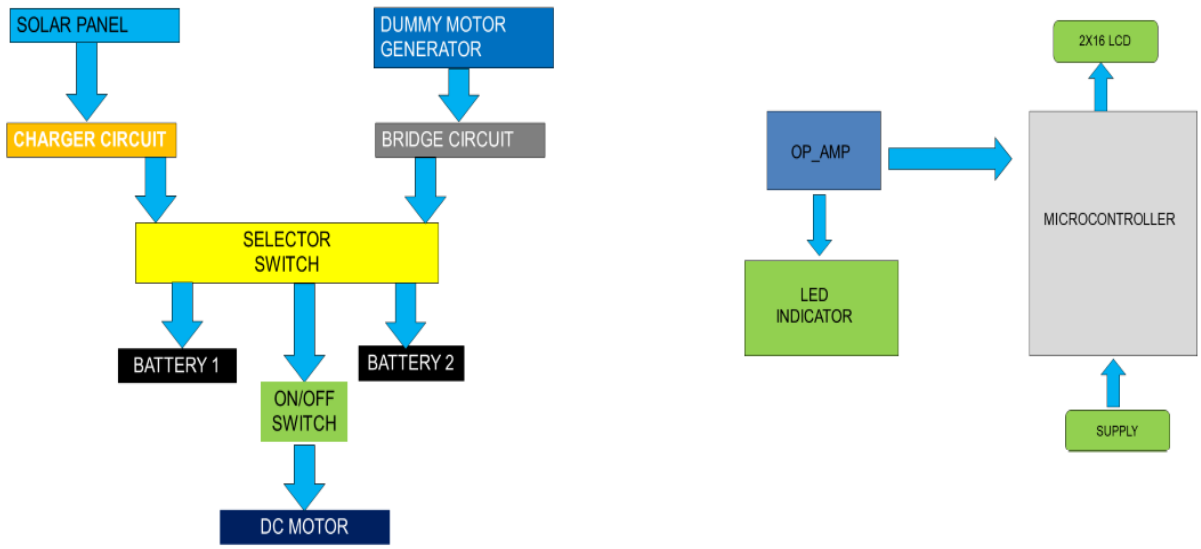
Key Word: *DC motor, Solar panel, LCD display, Battery etc.*

I. INTRODUCTION

A block In today's scenario the transportation sector is almost entirely dependent on single fuel petroleum. As the consumption of petrol was too high due to which this fuel can't be used as the primary transportation fuel in future. So our hybrid vehicle is the primary solution for overcome in this future. The domestic production of petroleum is steadily declining while our consumption continuously is increasing.

By considering above circumstances we are introducing the idea of hybrid vehicle technology is an excellent way to reduce the consumption of fuel and saving running cost. It is economical as compare to IC engine vehicles and this hybrid vehicle save the environment from pollution.

II. BLOCK DIAGRAM



III.BLOCK DIAGRAM EXPLANATION

Solar Panel:
Photovoltaic solar cell absorbed sunlight as a sources of energy to generate electricity. This device converts the light energy into electrical energy. When light allowed falling on this cell, the cell generates voltage across its. In this project we are use to mono crystalline cell (18V, 0.5 A, 5W). Solar power is use a supplementary sources of battery charging.

Dc Motor:-
A machine that covert DC power into mechanical power is known as DC motor.It mainly consist of three main parts, i.e. magnetic field system, armature and commentator. The other part of DC motor is yoke, pole shoe, field or exciting coil, armature core and windings, baring and shaft.

DC machine works on "when placed in a magnetic field, a current carrying conductor acquires torque and develops a tendency to move." The direction of force is given by Fleming's left hand rule and magnetic field given by;
F= BIL newton
In this project DC motor is used to make rotational torque on a vehicle. It is usually changed into a linear motion. In this project we are use 12V,200 RPM motor.

Dc Generator:-
A DC generator is an electrical device which converts mechanical energy into electrical energy. Basically, no any difference DC motor and DC generator. The DC generator basically works on the principle of dynamic induced EMF in a conductor. According to this principle, if the flux links with the conductor change then an EMF is induced in the conductor. The direction of induced EMF in the armature winding is given by Fleming's Right Hand Rule.
In this project we are use the motor as a generator, two motor are connected in series combination generates 8 volts for 200 rpm in our testing result.

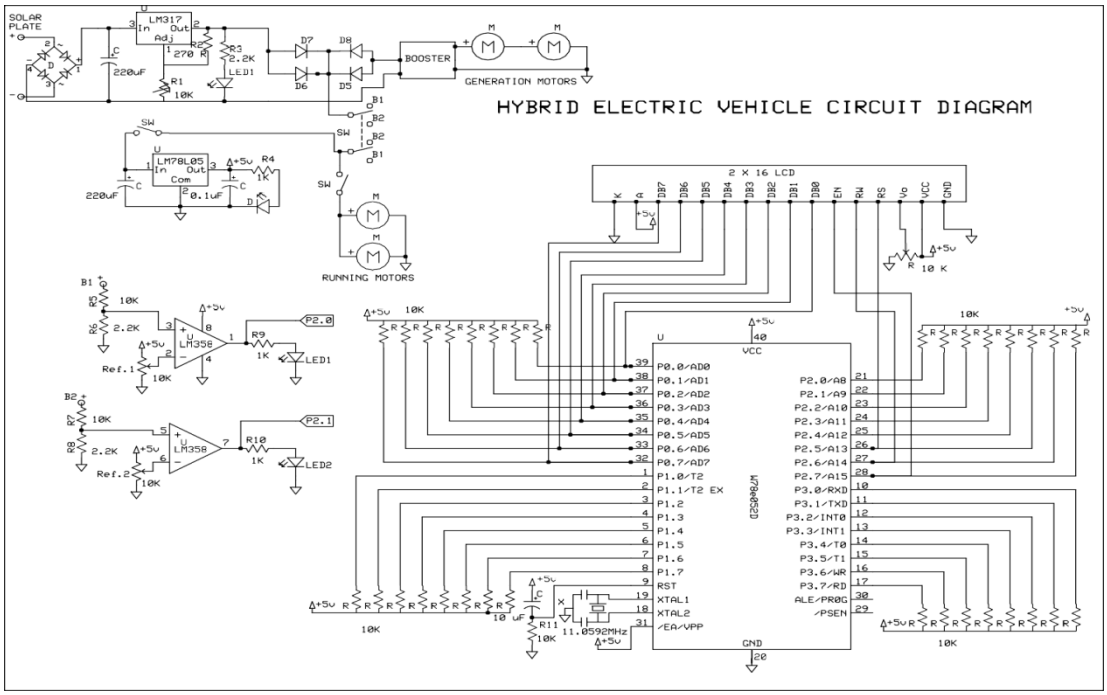
Battery:-
In this project we are use sealed lead acid rechargeable battery. Lead acid is the oldest rechargeable battery in existence lead acid was the first rechargeable for commercial use. Basically two battery set, one battery set initially charged and power delivered to the motor and another battery set initially discharged it used to store the power. One battery set consisting the three 4V batteries connected in series.

Microcontroller:-
It is a low power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash Programmable and Erasable Read Only Memory ROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the MCS-51. Instruction set and pin out. The on chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, it provides a highly flexible and cost effective solution so many embedded control applications.

LCD Display:-
LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is basic module and is commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD, each character is displayed in 5x7-pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

IV.WORKING PRINCIPLE



Basically our vehicle consist if five main parts i.e. battery, motor, solar, comparator circuit. Suppose there are two batteries, initially one is charged another is discharged. The charged battery connected to the motor through switch and discharge battery is connected to the solar and generator. When the switch is on then the charged battery delivered the power to the motor and according to principle of motor. "When a current carrying conductor is placed in a magnetic field, the conductor experience a mechanical force" motor is start to rotate and convert rotational motion into linear motion. It means that the electrical energy converted into mechanical energy. The vehicle will start running.

The back pair of wheel connected through shaft. A generator is connected to the shaft with the help of gear. The rotation of shaft gear will be rotate and hence the generator shaft also rotates. Generator convert the mechanical to electrical energy. According to Faraday's Law of electromagnetic induction the EMF is induced in a generator. The generator is produced some energy and fed to the discharge battery for charging but this power is not enough to charging the battery. So, another supplementary source is use for charging of battery i.e. solar energy.

Solar cell is convert light energy into the electrical energy. Hence, by using two source battery is charge in a sufficient value. Whenever, some distance covered by car, that time the charged battery is discharge. At same time the discharge battery now charged with the help of solar and generator. In this case battery terminal is charged with the help of relay. This way the vehicle is continuously running without any disturbance.

This total operation is possible for using a comparator circuit. This circuit is specially design for voltage comparison. It is compare the voltage with the help of op-amp LM358 and switch terminal by using relay. When the vehicle is in standing condition we can charged the battery from external supply of our houses or charging station. In this way hybrid vehicle works.

V. ADVANTAGES

1. Reduce fuel demand: our day to day life of fuel storage are declining continuously therefore cost of fuel is increasing. By using hybrid vehicle we are saving the fossil fuel.
2. Eco-friendly: this hybrid vehicle totally run on electricity, they emit less pollution than other vehicle.
3. Self-contained: do not require any external sources to running this car.
4. Cost of this vehicle is less as compare to other vehicle.
5. Regenerative braking is possible.
6. Number of parts required is less hence, less maintenance is required.
7. More reliable compare to IC engine vehicles.

VI.APPLICATION

1. This type of concept can be used in tramways.
2. Now a day this type of concept is used in various purpose of transportation.

VII. FUTURE SCOPE

1. For getting more electrical energy we can expand the system by adding alternative generating sources.
2. This electrical energy supply can also be given to auxiliary equipment in the car.
3. In future scenario cost of fuel is very high that's why this vehicle is more economical.
4. In today scenario less amount of fossil fuel is very high that's why this vehicle is more economical.
5. In today scenario less amount of fossil fuel is available in nature and this fuel is decaying day by day therefore this vehicle is more suitable for future.

VIII. CONCLUSION

In this project has presented new technique to reduce petroleum consumption. Hybrid vehicle have the potential to dramatically reduce future transportation consumption . In coming days this will prove a great boon to the world, since it will save a lot of fuel. As the conventional sources are depleting very fast, it's high time to think of alternative resources. In this project we are using generator for power generation this gives a 50 to 60% of efficiency. The generator power is not capable to fast charging hence,we are used solar plate. For using a generator and solar battery can be charge easily.

Based on analysis, we concludes that,

1. Hybrid vehicle provide for reducing fuel consumption beyond that IC engine.
2. Hybrid vehicle save the environment from pollution.
3. No fuel consumption so, cost is not required.

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