

HYBRID CITY COMMUTER

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Abstract:

As we are going to face energy crisis in next few decades we better hurry and search for new energy resources that can fulfil our needs for power and help us to sustain in future energy crisis. Hybrid vehicles are one of the ways that can help us to achieve that. Using hybrid vehicles we can reduce the consumption of gasoline fuels and also the emission level of hybrid vehicles are less that will reduce the impact on the environment. In future hybrid vehicles look like a promising way to sustain in fuel crisis. Many subsidies are given away by governments for users of the HEV to increase the number and increase the awareness about the HEV's in people. A compact hybrid two wheeler (hybrid city commuter) will surely help to commute mid-range distances in cities by avoiding traffic as well as reducing the use of petroleum fuels. We have to look after how to maximize the use of the HEV to help ourselves and to save the environment.

1. INTRODUCTION

A hybrid vehicle combines any two power (energy) sources. Possible combinations include diesel/electric, gasoline/fly wheel, and fuel cell (FC)/battery. Typically, one energy source is storage, and the other is conversion of a fuel to energy. The combination of two power sources may support two separate propulsion systems. Thus to be a True hybrid, the vehicle must have at least two modes of propulsion. For example, a truck that uses a diesel to drive a generator, which in turn drives several electrical motors for all-wheel drive, is not a hybrid. But if the truck has electrical energy storage to provide a second mode, which is electrical assists, then it is a hybrid Vehicle.

These two power sources may be paired in series, meaning that the gas engine charges the batteries of an electric motor that powers the car, or in parallel, with both mechanisms driving the car directly.

Dr. Ferdinand Porsche who built the first car to combine an internal-combustion engine with electric motors. The car, which was constructed in 1898.

The closest correlating model to Dr. Porsche's original hybrid would be the Chevrolet Volt. The Volt is an electric car that can be recharged using a household outlet. When the car's rechargeable battery reaches a minimum state of charge, a gasoline engine starts and serves as a power source for a generator, which is then used to power the front wheels with electricity.

1.1 Proposed work

- i. Design of the new compact and easy to handle hybrid electric two wheeler.
- ii. Vehicles to be designed which will be helpful for commuting to daily works and office in urban as well as rural areas.
- iii. Vehicle should be helpful in overcoming the limited range problem of electric vehicles.

1.2 Proposed solution

- i. Detailed study about different hybrid system, power storage sources, power producing system and product design procedure
- ii. Study of parts regarding its sequence in assembling unit and orientation of parts in assembly
- iii. Different proposals of orientation of parts in drive train of vehicle, their merits and demerits
- iv. According to the selected orientation of parts, different proposals of drives.
- v. Selection of drive train among different proposals by considering ergonomics consideration, cost and economy and working principle.
- vi. Design of vehicle.
- vii. Preparation of manufacturing drawing

1.3 Outcomes of the project

- i. Vehicle designed will be useful for travelling for all age level of people easily to their respective work places, schools, offices etc.
- ii. Designed vehicle will also consider the ergonomics conditions for the human comfort.
- iii. Vehicle will result in reduction in cost of fuel, reduction in time and pollution, and safe handling.
- iv. A compact city commuter vehicle for all ages.

2. Construction Working Principle of Hybrid electric vehicle (HEV)

Hybrid vehicle is that vehicle which combines any two types of drives; the hybrid electric vehicle combines a gasoline engine with an electric motor. An alternate arrangement is a diesel engine and an electric motor (figure 1).

As shown in Figure 6.1.1, a HEV is formed by merging components from a pure electrical vehicle and a pure gasoline vehicle. The Electric Vehicle (EV) has an M/G which

allows regenerative braking for an EV; the M/G installed in the HEV enables regenerative braking. For the HEV, the M/G is tucked directly behind the engine. In Honda hybrids, the M/G is connected directly to the engine. The transmission appears next in line. This arrangement has two torque producers; the M/G in motor mode, M-mode, and the gasoline engine. The battery and M/G are connected electrically.

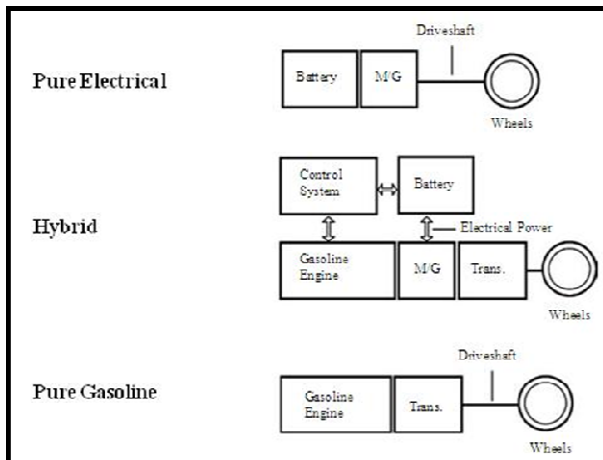


Figure 6.1.1: Components of HV that combines a pure gasoline with a pure EV.

HEVs are a combination of electrical and mechanical components. Three main sources of electricity for hybrids are batteries, FCs, and capacitors. Each device has a low cell voltage, and, hence, requires many cells in series to obtain the voltage demanded by an HEV. Difference in the source of Energy can be explained as:

- The FC provides high energy but low power.
- The battery supplies both modest power and energy.
- The capacitor supplies very large power but low energy.

The components of an electrochemical cell include anode, cathode, and electrolyte (shown in fig6.1.2). The current flow both internal and external to the cell is used to describe the current loop.

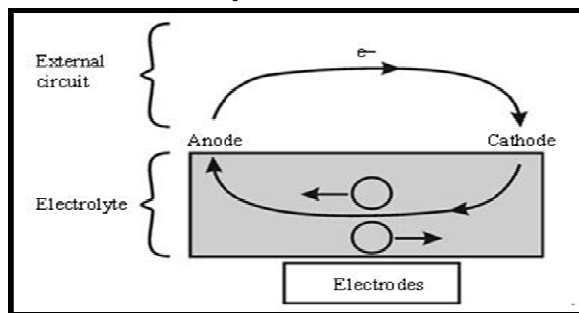


Figure 6.1.2: A circuit for a cell

The motion of negative charges is clockwise and forms a closed loop through external wires and load and the electrolyte in the cell.

A critical issue for both battery life and safety is the precision control of the Charge/Discharge cycle. Overcharging can be traced as a cause of fire and failure. Applications impose two boundaries or limitations on batteries. The first limit, which is dictated by battery life, is the minimum allowed State of Charge. As a result, not all the installed battery energy can be used. The battery feeds energy to other electrical equipment, which is usually the inverter. This equipment can use a broad range of input voltage, but cannot accept a low voltage. The second limit is the minimum voltage allowed from the battery.

3. CAD MODEL OF HYBRID CITY COMMUTER

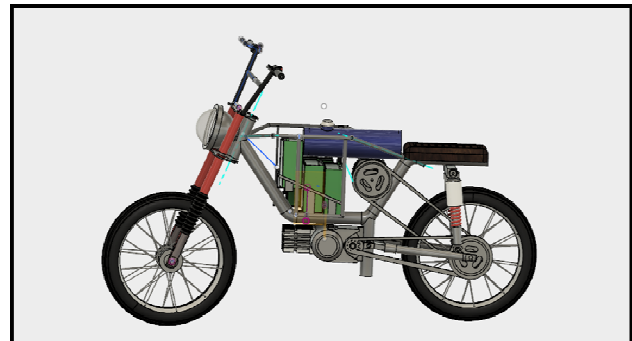


Fig. 3.1 Modelling of HEV

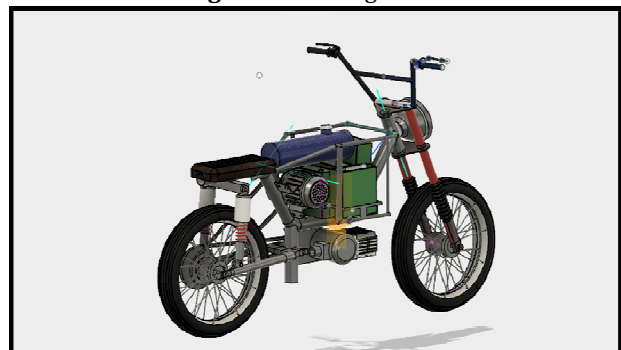


Fig. 3.2 Modelling of HEV

3. CONCLUSIONS

World is looking for new energy sources to fight fuel crisis and Hybrid city commuter look like a promise able way to face fuel crisis in future. After studying the various parameters regarding hybrid vehicles we can understand that by carefully planning implementation of hybrid vehicles can be increased.

We have problems like high initial cost, charging time cycles, conversion that can be solved by recycling older spent batteries, providing charging stations publically and using dual drive mode. More ways to improve hybrid vehicles will emerge more people will turn towards hybrid vehicles.

The environment also needs our attention as we are polluting the environment heavily since last century it will be bad impact on ourselves as the global warming will create in riding the sea level. So more than just for saving fuels we

must alter ourselves to hybrid vehicles to save the environment.

By practical implantation carried out with the help of government we can succeed in that. At last we can say that Hybrid Vehicles are really a emerging source as a alternating power source and we should use it wisely for betterment of ourselves.

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