

Development of Two Wheeler Hybrid Vehicle

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Abstract— According to survey in April 2,70% of air pollution due to vehicle. Hybrid electric vehicle, the compound connection type Hybrid electric vehicle's actuation pattern. Hybrid electric vehicle using the engine and the electric motor supplementary working pattern can make the engine to be in the best working condition throughout. Hybrid two wheeler vehicle which relies not only on batteries it's also through working on an internal combustion engine which drive alternate drive to internal combustion engine to electric power drive. Hybrid electric vehicles combine an electric motor, battery and power system and with an internal combustion engine to achieve charging capacity for battery due to which better fuel economy.

Key words: Hub Motor, Batteries, Switching Circuit, I.C. Engine

I. INTRODUCTION

In recent year, air pollution has acquired critical dimensions and the air quality in most Indian cities that monitor outdoor air pollution fail to meet WHO guidelines for safe level. The growth in production of passenger vehicle is 34.8%, commercial vehicle 37.44%, Two wheeler vehicle is 24%, three wheeler vehicle 27%, as compared last 12 years. So, recent pollution status to alerts ourselves and other also to using Electric vehicle or Hybrid vehicle. The prosperated project focus on Hybrid two wheeler vehicle which using 350 watt BLDC motor and also using 4 batteries of 12 volts. The working model shall be prepared to demonstrate hybrid system in two wheeler vehicle. Performance parameters, cost analysis shall be evaluated on the working model.

II. HISTORICAL PERSPECTIVE

Soniya.K.Malode et al[1](2016) has been invasigate that, The regenerative braking is one of the important system in electric vehicles generation. The regenerative braking has the ability to save the waste energy up to 8-25%.. Due to the petrol price increase gives rise to research and progress in energy conservation. R. Suarez-Bertoa* et al[2](2016) has been invasigate that, Regulated and unregulated emissions from one light duty hybrid electric vehicle (HV2) and one plug-in hybrid electric vehicle (PHV1) have been studied over the WLTC using E5 and E10 fuel blends. PHV1 resulted in lower emissions than HV2 due to pure electric strategy of the former, which relied on the continuous use of battery for up to 10 km of the WLTC. Li Houyu et al[3](2011) has been invasigate that, 1. Series hybrid electric vehicle's working pattern 2. Parallel hybrid electric vehicle's working pattern 3. Combined hybrid electric vehicle's working pattern 4. The hybrid electric vehicle uses the engine and the motor supplementary working pattern when starting or traveling at a low speed. The vehicle only depends upon the electric drive (compound connection type), and this time the engine off, vehicles' fuel oil consumption is a zero. It will be the widely-

used energy-saving type of vehicle in the future.], Lambros K. Mitropoulos a*, et al[4](2016) has been invasigate that, The HEV was found to have the lowest TCO due to the low cost of gasoline. Its low life cycle cost resulted from the low emission impact cost, the improved fuel efficiency and the low manufacturing cost. Such barriers include infrastructure, maintenance and repair shops, and overall awareness and familiarity with alternative fuel systems. V.P.Waghmare *, et al[5](2014) has been invasigate that, The driver does not require efforts to start and stop the vehicle and need not compromise to This system raises the alarm to the society to cut CO2 emission, save fuel and preserve the nature as well as solution to the mentioned issues. This system automatically stops and restarts the vehicle whenever engine spends time in idling at traffic jam or at traffic signal. Mr. Yadnesh Keny et al[6](2014) has been invasigate that, The technology of hybrid petro electric bikes is an emerging field in now a days and the total cost on these types of vehicles very profitable for the future and also solves the issue of natural resources scarcity and is an ecofriendly bike. This type of vehicle is very cost effective for middle-class families. The mileage of the bike is increased from 60 to 90 km for 1 liters of gasoline and fully charger battery. This can be used mainly in city. Mohd. Salman Alim et al[7](2014) has been invasigate that, Reducing fuel consumption and pollution without any effect on performance will reassessed the concept of automobile. Only improvements of the current technology can help it progress within reasonable time and financial limits. Its adoption by the automobile industry would have a good impact on the environment and world economy. Bhushan – Bajaj, al[8](2016) has been invasigate that, Mahindra E20 India's first completely electric vehicle, manufactured in green facility Offers innovative battery rental scheme - Goodbye Fuel Hello Electric (GFHE) On road price of INR 4.79 lakh (approx. 7542 USD) and fixed energy fee of INR 3,000 (47 USD) per month for 5 years / 50,000 km Sold only 1000 units in the past 15 months (target of 500 units per month) Plans to expand to Europe and South Asian countries where EV sales are picking up and government incentives are available.

III. PROBLEM DEFINITION

- High pollution in atmosphere due to vehicle.
- This process starts when the consumer identifies the need for the product and the service it provides. This is triggered by the environment, the circumstances of the customer.
- Increase the cost of fuel.
- That is moving for any movie, wedding, cultural or traditional occasions, the vehicle has to take the full load of the Family at that time. And in these situations where the people should keep up time for their work and needs, the consumer will think a lot about these factors

IV. RESEARCH OBJECTIVE

- Carrying out a detailed study on types of two wheeler hybrid vehicle and its design.
- Development two wheeler vehicle with front wheel powered by electric motor and rear wheel drive powered by internal combustion engine.
- A switching circuit used to switch from IC Engine to electric power and vice versa.
- Developing the suitable hybrid electric vehicle and analyzing for fuel efficiency.
- Assembling of IC Engine.
- Assembling of the Electric Power Drive.
- Modification and assembly of hybrid vehicle

V. BLDC MOTOR

Types of motor	Hub motor
Design of motor	250watt BLDC motor(Brushless motor)
Torque	12 Nm
Speed	350 RPM
Voltage	48 V (24Ah)
Efficiency	>=80%
Weight	7 Kg

Table 1: Specification of Hub Motor

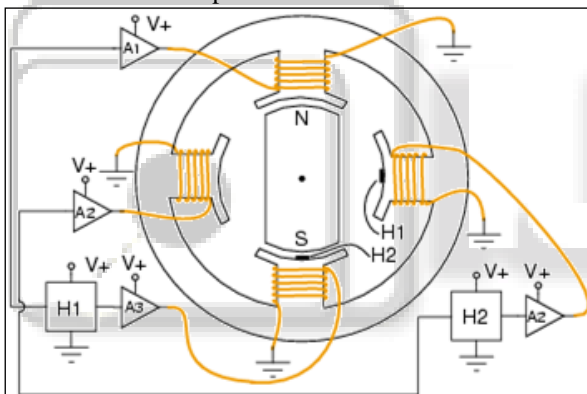


Fig. 5.3: Diagram of BLDC Motor

BLDC motor is a closed loop synchronous motor. It has all the characteristics of DC Motor with some added features. Its advantages are as follows:

- 1) It is cheap.
- 2) It can save 30% to 50% of power consumed by a normal motor and has high efficiency of 80% to 90%.
- 3) It is small in size. It can have high torque at low speed.
- 4) Speed range can be customized.

VI. BATTERY

Hybrid Electric Vehicle uses battery as one of its power source for vehicle motion during at low power conditions. Batteries are devices that consist of electrochemical cells and provide electrical energy converted from stored chemical energy [5]. Generally batteries are of two types: primary batteries that are disposable and secondary batteries that are rechargeable. Secondary batteries are preferred for vehicles as they can be rechargeable.

There are six major rechargeable batteries available today. They are as follows: lead-acid (Pb- acid), nickel-cadmium (NiCd), nickel-metal hydride (NiMH), lithium-ion

(Li-ion), lithium- polymer (Li-poly), zinc-air [12]. The basic performance characteristics of the battery which influence the design are as follows:

Electrochemistry Cell	Voltage
Lead-acid	2.0
Nickel-cadmium	1.2
Nickel-metal hydride	1.2
Lithium-ion	3.4
Lithium-polymer	3.0
Zinc-air	1.2

Table 5.3: Average Cell Voltage during Discharge in Various Rechargeable Batteries

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