

# Fabrication of Hybrid Vehicle

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**Abstract**— In Automobile sector with the advancement in 21st Century the need for alternative fuel as a replacement of conventional fossil fuel due to this depletion & amount of emission has given way. The paper start with history of hybrid vehicles our paper is based on the explanation of technologies their functions, drawback, efficiency. The conventional I.C Engine is the major source of pollution. The objective is to fabricate a hybrid car powered by both battery & gasoline. Hybrid vehicle relies not only on batteries but also on internal combustion engine which drives a generator to provide electricity & may also drive a wheel. This vehicle is highly suited for growing urban areas with high traffic. Initially the designing of vehicle. Equipment & their cost analysis are done it deals with fabrication of vehicle. This includes assembly of I.C Engine & its components the next phase consists of implementing the electric power drive & designing the controllers. The final stage would consists of increasing the efficiency of vehicle in economic ways.

**Keywords:** Electric Power Drive, Designing the Controllers, Replacement of Conventional Fossil Fuels, Powered by Both Battery and Gasoline

## I. INTRODUCTION

The significant growth of today's cities has led to an increased use of transportation, resulting in increased pollution and other serious environment problems. Gases produced by vehicle should be controlled and proactive measures should be taken to minimize these emissions. The automotive industry has introduced hybrid cars. Any vehicle is a hybrid when it combines two or more sources of power. For example such as moped with pedal. Hybrid vehicle is considered as the most industrially matured technology & has efficiency more than cars running. Currently, the hybrid vehicles which are running are like when the vehicles turn the battery power & turn off 2-cylinders & the vehicle runs on 2-cylinder & battery power but this vehicle will be like running totally on battery or an IC engine just as the Petrol- CNG car.

## II. LITERATURE REVIEW

As per the studies, HEV'S combine the I.C Engine of a conventional vehicle with the battery & electric motor of an electric vehicle. This combination offers the extended range with great environmental benefits of an electric vehicle. The practical benefits of HEV include improved fuel economy & lower emissions of the full host of criteria pollutants as well as CO<sub>2</sub> compared to conventional vehicles. The inherent flexibility of HEV'S will allow them to be used in wide range of applications. Where electric only vehicle cannot from personal & public transportation to commercial hauling. Our point of view is that this vehicles have a good market value based on current environmental situations they may offer a great change in the world of automobile. The fabrication of this vehicle at early stage will help our industry to determine

the further problems which would come in it as per the road conditions & favorable climate conditions. The consumers need can also be determine with the help of early development of hybrid cars.

### A. Concept of HEV:

A gasoline electric hybrid vehicle is an automobile which relies not only on gasoline but also on electric power source. In HEV, the battery alone provides power for low speed driving conditions it can't be used at long highway & hill climbing. It will provide better fuel economy & lesser environmental impact over conventional automobiles.

### B. Fabrication of HEV:

The placement of the battery's will be in the front hood or in below the front seat in a "MARUTI 800" there's a lot of space available in it. The battery stand will be a metal welded stand. The motor will be connected to the front wheel hub while will give us a front wheel electric drive. The fabrication work is further shown in the table below:-

Component	Percentage Manufactured (Company made)	Percentage Fabricated in workshop
Engine	100%	-
Transmission	100%	-
Chassis	50%	50%
Hub motor	100%	-
Stirling Engine	100%	-
Suspension	100%	-
Tyre	100%	-
Motor Controller	-	100%
Power Control System	-	100%
Assembly of components	-	100%

## III. OBJECTIVE

Fabrication of HEV.

Assembly of Power Drive.

A switch circuit used to switch from IC Engine to Electric Power and vice versa.

Improvising Efficiency.

– Components

Car

Hub Motor Engine Transmission Suspension

Battery (Lead-acid) Brushless DC motor

– Changes will be doing –

We will be replacing the Dead Axle with Live Axle for transmission of power to the Wheels. For suspension, we will be using Telescopic Spring instead of the usual Coil Spring

present in the Car. To transmit the Power or Drive to axle, BLDC Motor will be providing torque to the Differential on the Rear axle and further.

The main purpose to use this type of specified motor is that the cost of the motor is low. It can save 30% to 50% of power consumed by a normal motor. It is small in size it can have high torque at low speed. We will also be replacing the Drum Brake with Disk Brake so as to eliminate the Complex Assembly in the vehicle. With the help of an electric circuit we will be providing A Switch so as to chance the drive from IC Engine to the Electric Power and viceversa.

#### IV. CONCLUSION

HEV is a vehicle that uses two sources of power gasoline & battery. For low power application battery drive is used whereas for high power application where power requirement is very high gasoline engine is used. Gasoline drive is most efficient at high speed drive this HEV'S both made of operation occurs at their max efficiency. As this hybrid vehicle emits 50% less emission than normal vehicle it plays an important role for reducing pollution to certain extent without compromising with efficiency. Thus it is most efficient in urban areas mainly in high traffic where gasoline engines are least efficient as the energy from gasoline is being wasted away and creates pollution.

#### REFERENCES

- [1] M. J. Riezenman, "Electric vehicles," IEEE Spectrum, pp. 18–101, Nov. 1992.
- [2] H. Shimizu, J. Harada, C. Bland, K. Kawakami, and C. Lam, "Advanced concepts in electric vehicle design," IEEE Trans. Ind. Electron., vol. 44, pp. 14–18, Oct. 1997.
- [3] C. D. S. Tuck, Ed., Modern Battery Technology, Harwood, p. 411, 1991. M. Terashima, T. Ashikaga, T. Mizuno, and K. Natori, "Novel motors and controllers for high-performance electric vehicle with four in-wheel motors," IEEE Trans. Ind. Electron., vol. 44, pp. 28–38, Feb. 1997.
- [4] R. Prabhakar, S. J. Citron, and R.E. Goodson. "Optimization of Automobile Engine Fuel Economy and Emissions." ASME Paper 75- WAI/Aut-19, Dec. 1975.
- [5] C. Kricke and S. Hagel, "A hybrid electric vehicle simulation model for component design and energy management optimization," in Proc. FISITA World Automotive Congress, Paris, France, Sept. 1998.
- [6] V. Wouk, "Hybrids: Then and now," IEEE Spectrum, pp. 16–21, July 1995.
- [7] M. Ehsani, K. M. Rahman, and H. A. Toliyat, "Propulsion system design of electric and hybrid vehicles," IEEE Trans. Ind. Electron., vol. 44, pp. 19–27, Feb. 1997.