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Fabrication of Hybrid Petroelectric Vehicle

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ABSTRACT
In automobile sector, the need for alternative fuel as a replacement of conventional fossil fuel, due to its depletion and amount of emission has given way for new technologies like Fuel cells vehicles, Electric vehicles. Still a lot of advancement has to take place in these technologies for commercialization. The gap between the current fossil fuel technology and zero emission vehicles can be bridged by hybrid technology. Hybrid vehicles are those which can run on two or more powering sources/fuels. Feasibility of this technology is been proved in four wheelers and automobile giants like Toyota, Honda, and Hyundai have launched successful vehicles like Toyota prius, Honda insight etc. This technology maximizes the advantages of the two fuels and minimizes the disadvantages of the same. The best preferred hybrid pair is electric and fossil fuel. This increases the mileage of the vehicle twice the existing and also reduces the emission to half. At present, we like to explore the hybrid technology in the two wheeler sector and its feasibility on road. This paper deals with an attempt to make a hybrid with electric start and petrol run. Further a design of basic hybrid elements like motor, battery, and engine.
As on today, hybrid products are one of the best solutions for all pollution hazards at a fairly nominal price. An investment within the means of a common man that guarantees a better environment to live in.
Keywords **-** Internal Cmbustion Engines; Petrol Vehicle; Electric Vehicle ; Hybrid Vehicle.

I. INTRODUCTION

HYBRID VEHICLE:

Any vehicle is a hybrid when it combines two or more sources of power. For example, a moped (a motorized pedal bike) is a type of hybrid because it combines the power of a gasoline engine with the pedal power of its rider. Most of the locomotives we see pulling trains are diesel-electric hybrids. Cities like Seattle have diesel-electric buses -- these can draw electric power from overhead wires or run on diesel when they are away from the wires. Submarines are also hybrid vehicles -- some are nuclear-electric and some are diesel-electric. Any vehicle that combines two or more sources of power that can directly or indirectly provide propulsion power is a hybrid.

II. ELECTRIC BIKE

Economics, the cost of gasoline and diesel fuel, and air pollution will affect the use of electric bikes in general. Today's fuel price in some nations is related to the cost of production and in other nations to the need to control imports. The price of fuel in the future will be affected by the exhaustion of reserves of petroleum and natural gas, and the need to limit (1) the pollution of the environment and (2) the generation of carbon dioxide.

Atmospheric pollution by motor vehicles in cities can be prevented only by Prohibiting these vehicles in down town zones.

In this new environment electric bikes performance will improve in terms of travel range on a charged battery, battery life, reliability, riding comfort, and many other features. New electric bikes builders will spend substantial money on improved bikes performance in order to capture a leading marketing position from the existing producers. For example, China will undoubtedly market low cost electric bikes from a high-production factory.

We expect to see significant and continuing improvements in the travel range of electric bikes from improvements in the energy content of batteries. By and large, **electric bikes** are simple to use, ride, and maintain. They require little maintenance beyond what a standard bike requires**. Electric bikes** are used for a variety of purposes, ranging from effortless commuting to pure leisure. They attract riders from all backgrounds.


Fig:1electric bike


Fig:2 Tvs scooty

III. SPECIFICATIONS OF SINIC BIKE (ELECTRIC BIKE):

Dimensions	=	1900 x 730 x 1040
Weight	=	75kg
Wheel size	=	16" x 3"
Speed	=	22 to 24 kmph
Motor power	=	240 w
Battery	=	48v / 20ah
Charging period	=	6to 8 hrs
Loading capacity	=	120 to 140 kg
Tyre pressure	=	2.06841bar (30psi)
Fuse rating	=	25amp

SPECIFICATIONS OF TVS SCOOTY

Engine	4stroke, single Cylinder, Air cooled
Displacement	60 cc
Bore and stroke	51 x 43
Compression ratio	up to 11
Max. Power	5BHP@6500rpm
Max torque	5.8 Nm@ 4000rpm
Transmission	variometric
Clutch	Pivoted Clutch Centrifugally Operated
Ignition	CDI
Fuel Supply	Carburetor UCAL Mikuni
Battery	12V, 5AH
Head lamp	35/35 W
Tail / Stop Lamp	5/21W
Seat height	740mm
Wheel Base	1230mm
Ground clearance	135mm
Weight	75kg
Fuel tank capacity	5Litres

Fig: 3 Internal combustion engine

IV. CONSTRUCTION OF HYBRID PETROELECTRIC BIKE:

First inspection is done for the front wheel dimensions of the TVS SCOOTY i.e., it should match with the rear wheel of the electric bike. Then the front wheel of the TVS SCOOTY has been removed and the fork has been altered, So that it fits exactly to the size of the motor wheel. The front wheel, the motor wheel has been connected to the forks by using the arc welding and made a joint. It had been coupled using a universal joiner. The set of series connected 4-batteries set is kept on the space between the seat and the engine. The wires from the power booster are connected to the ultra saver kit so as to regulate the voltage fluctuations that is passing and also to supply various voltages required by the other parts of the vehicle (includes bulbs, horn, indicators etc.).

Once the connections are made to the batteries, ultra saver, power booster and the motor forms an electric circuit. A cutoff switch is connected to the front side of the bike to convert from the petrol engine to the motor engine. The power booster is connected to the throttle and the motor wheel.

In general there will be six connections that will be present between motor and the power-booster four of the connections will be to the motor steps this will increase the motor speed in step wise and the remaining are used for heat sensors and load sensors. A MCB (miniature circuit breaker switch) is connected to protect the circuit from damaging.

The throttle will have two connections one is connected to petrol engine and then it is connected to the electrical circuit through a small device to the power booster to control the flow of power to the motor. The circuit will control the four steppers used in the front motor.Speed is regulated by using this throttle. There are different types of steppers used for different bikes. In this hybrid vehicle, speed control ranges from 2.5 to 10 AH.

V. DISTANCE COVERED DURING EACH MODE:

Distance covered during Petrol mode:	45.4 K.M
Distance covered during Battery mode:	34.6 K.M
Distance covered during power mode:	12.6 K.M

VI. TABLE SHOWING COST ANALYSIS AND DISTANCE:

Mode	Person weight	Price	Distnce KM	Price per unit distance					
Petrol	65	75	45.4	1.66					
Battery	65	6	34.6	0.12					
Power saving mode	65	0	12.6	0.0					
Total in hybrid petro electric bike	65	75+6=81	91	0.86					

Table.1 cost analysis and distance

Thus from the above table we can clearly say that the amount of fuel consumption using the hybrid vehicles will be less.

VII. ADVANTAGES:

- Less cost low economy
- Easy maintenance
- Less pollution
- Less Wear on Engine Components
- Reduce Dependence on Fossil Fuels

VIII. DISADVANTAGES:

- High initial cost.
- Overall weight of the bike increases.
- Different Driving Experience.
- New parts and servicing can be inconvenient and expensive.
- There may be a short circuit problem in the electric components.

IX. CONCLUSION:

The technology of hybrid petro electric bikes is an emerging field in now a days and the total turn one on these types of vehicles very profitable for the future and also solves the issue of natural resources scarcity and is an eco friendly 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 litre of gasoline.

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