

Hybrid Vehicle

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ABSTRACT :This research paper is about to 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 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. 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. In this paper the Hybrid bike system, the power is delivered both via an internal combustion engine and electric motor. The electrical power is used to achieve either better fuel economy than a conventional vehicle, better performance and it cause less pollution. Driving mode selectivity improves this system more economical, stable and more efficient.

KEY WORDS: Design, Bldc Hub Motor, Controller, DC To Dc Converter, Battery.

I. INTRODUCTION

One of the major problem that we face on day to day life is Energy Crisis. Our paper is one of the solutions for energy crisis. The system we implemented is a hybrid electric bike. The project has a number of benefits to both the team members as well as external benefits through increasing awareness of alternative transportation modes. The projected benefits of more people relying on non-polluting modes of transport.

Hybrid electric vehicles (HEVs) combine the benefits of gasoline engines and electric motors and can be configured to meet different objectives such as improved fuel economy, increased power, or

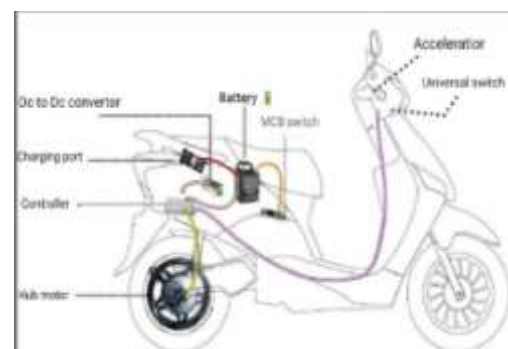
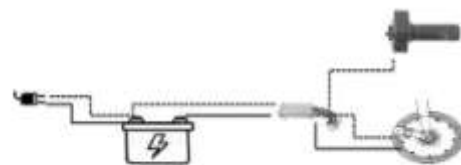
additional auxiliary power for electronic devices and power tools. This type of vehicle is considered to have better performance and fuel economy compared to a conventional one.

11. HYBRID SYSTEM

Definition: A hybrid electric (HEV) is a type of hybrid vehicle and electric vehicle which combines a conventional internal combustion engine (ICE) propulsion system with an electric propulsion system.

The combination of an internal combustion engine(ICE) with one or more electric motor or generators and a battery pack Combines propulsion system with RESS and gets better fuel economy An HEV uses less gasoline because the electric motor does some of the work.

11.1.DESIGN



PROCESS OF WORKING

Full hybrids use a gasoline engine as the primary source of power and an electric motor provides additional power when needed in addition, full hybrids can use the electric motor as the electric motor as the sole source of propulsion for low-speed, low-acceleration driving, such as in stop-and-go traffic.

Starting: When a full hybrid vehicle is initially started, the battery typically powers all accessories the gasoline engine only starts if the battery needs to be charged or the accessories require more power than available from the battery. The battery stores energy generated from the gasoline engine or during regenerative braking from the electric motor. Since the battery powers the vehicle at low speeds, it is larger and holds much more energy than battery used to start conventional vehicles

Breaking up: This electric-only driving mode can further increase fuel efficiency under some driving conditions

SCOPE OF HYBRID TWO WHEELERS

All existing two wheelers that are in the market cause pollution and their fuel cost is also increasing day by day. To compensate the changing fuel cost and curb down the high pollution levels, a good remedy is needed. Zero tailpipe emission technologies have long been held up as the last solution to transportation-related pollution problems. Electric two wheelers have been offered for several decades. Electric two wheelers, with their zero tailpipe emissions, can significantly improve urban air quality.

OUR PRODUCT



The concept is to club the two technologies, one of an Internal Combustion Engine with the Electric main drive. Which will have the maximum speed of the motor to 50km/hr. and 120kmpl in Head light works both electric and petrol mode, A dual throttle system for an internal combustion engine includes first foot pedal throttle and a second hand controller throttles up fuel

efficiency main highlight is less pollution and back fuel is always available.

Working Principle:The working principle of HYBRID BIKE basically involves three processes, the first process involves when the vehicle is running by means of internal combustion engine, second process involves when the vehicle is running by means of an electric motor and the third process involves when the vehicle is running in both them

Petrol mode:In petrol mode, engine will supply power to the rear Wheel. When the switch is moved to this position the Microcontroller will sense the position of the switch and Transmits signal to the relay, which will energize the ignition Coil and operate the starter motor. The rider can control the Speed by means of ordinary accelerator handle. In this mode The BLDC motor will be in ideal position at the front wheel, Where its battery connections are cut off by another relay which again Controlled by the micro controller. This mode Can be activated when we require high power outside the city Limits. During this high power operation engine will run on its Own rated rpm, so the fuel consumption are considerably low, Also the pollutants coming out of the exhaust is reduced.

Electric Mode:Here we are using the BLDC hub motor which is running with help of battery power. Battery is placed in the goods space under the seat. The motor are fixed on the front wheel of the vehicle and it is controlled through the controlled unit. The hub motor is steadily emerging as a standard drive method just like e-bikes, scooters, solar cars, and many other light electric vehicles. With a hub motor conversion, there is no need for external mounting brackets and drive chains to support a motor and transmission. The direct drive hub motor is about as simple as things get. The motor are exactly fixed as in center axis of the wheel hub. Now the vehicle rim starts to spin over the axis body for rotation of wheel. The electric power supply is charged to the battery through the separate charger. Here some losses may be occurred due to mechanical friction. Here we are also having the fuel drive which is coupled with the back wheel of the vehicle. When

The vehicle is driven inside the city, running in the plain and need of low power the vehicle is powered by means of a motor. The power to run the motor is supplied from the battery. During this process the speed of the vehicle will be minimum and there is no smog forming pollutants produced during the vehicle runs. The mileage of

the vehicle while running on the electric motor is mainly depends upon the time of charging and also depends upon the capacity of the battery.

Hybrid Mode: This is a special type of mode where rider does not care about the current mode of operation. This is entirely controlled by microcontroller. In this mode switch will be in S3 position. Microcontroller is programmed as when the Vehicle is running in 30kmph or less than that, electric mode will be activated. If it is above 30kmph, then petrol mode is to be operated. To sense the speed of the vehicle, we are going to take speedometer readings as input. At city limits the vehicle operates in electric mode and in outer it will operate in petrol mode. Therefore we can reduce the energy consumption, Pollution, 8 rupees per 80km

II. RESULT

Total battery watts = battery volt (v) × battery ah (i)
= 56 × 40
= 2240

Time travelled = battery watts / motor watts.
= 2240 ÷ 1200
= **1.866 hrs.**

Motor runs at 45 km/hr.

There for
= 45 × 1.866 × 45
= **83 Km**

ADVANTAGES

- ❖ Mobility
- ❖ System Integration
- ❖ Value Added Feature
- ❖ 1 full charge get 80-90 km
- ❖ For 80 km cost = ₹ 2.501 km = ₹ 0.2
- ❖ Works both electric and petrol
- ❖ It gives high torque
- ❖ Double acting accelerator
- ❖ Easily change modes from electric drive to petrol drive and back

III. CONCLUSION

Nowadays, it is very essential to use electric system vehicles as the cost of crude oil are raising. Such a change cannot be accepted by common people easily. To make this solution affordable to common people, it is the option that instead of turning existing petrol vehicles into scrap, we can utilize it as hybrid electric vehicles. Recently, two-wheelers sales in India in 2017/18 is up to 2Cr. and out of which, 40% are scooters. Hence, we are focusing on retrofitting of existing scooters into hybrid electric scooter. This project gives modified product of the existing system by making changes in the existing system, it will give

a more enhanced outcome. It can overcome problems in existing electric scooters such as low speeds, unavailability of charging stations when batteries are getting to be discharged. This will also reduce Co2 emission, import cost of crude oil. It is a cost-effective solution. Thus, it gives good contribution to a society

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