



Design and Fabrication of Electric Motor Coupled Three Wheeler

KEYWORDS

hybrid vehicle, electric vehicle.

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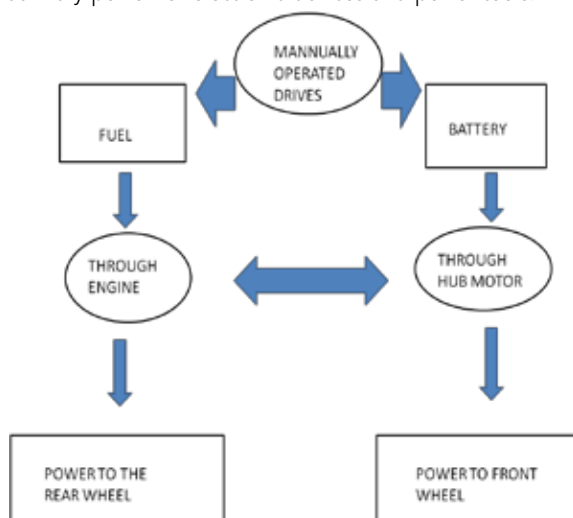
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ABSTRACT Initial torque in the vehicle will be more and thereby uses more fuel at the start[1]. Henceforth we are using an electric motor for the start of the vehicle and shifting to normal engine power for higher speeds[3]. This concept is based on the principle of hybrid vehicle.

Introduction of hybrid vehicle

A new hybrid vehicle which runs by using electric power and petrol engine is fabricated to give extra mileage as well as extra torque while this can ride simultaneously on both drives[2]. This vehicle will run on electrically at slow speed and at higher speed we can manually change to the engine drive[3]. Thus the mileage gets increase and the pollution can decrease. This hybrid vehicle consists of electrically operated wheel, a power supplying battery, battery charging device, and a petrol engine. A hybrid vehicle is a vehicle that uses two or more distinct power sources to move the vehicle. Hybrid-electric vehicles (HEVs) combine the benefits of gasoline engines and electric motors and can be configured to obtain different objectives[1], such as improved fuel economy, increased power, or additional auxiliary power for electronic devices and power tools.



Working Principle

In this hybrid vehicle the rear wheel operated by two stroke 70cc petrol engine of 3.5Bhp[1].

The battery is connected to the electrically operated front wheel which have the potential to give the extra torque to

the vehicle[1].

By changing the mode we can ride the vehicle in either by using DC battery or by petrol engine.

The front wheel is driven by the hub motor. The hub motor is connected to the battery[2].

There are four 12v batteries gives the power to a 500 Watt hub motor.

Advantages[3]:

Higher fuel efficiency

Increase the gear shifting time

More safe and comfortable

Design:

After the design calculation done as per PSG design data book, the parts of the vehicle are designed to be as follows,

| | |
|----------------------|--------------------------|
| Engine specification | |
| type | 2 stroke petrol engine |
| Displacement | 70 cc |
| Max. Power | 2.61KW |
| Design Calculation | |
| Chain | 18 Factor of Safety |
| Spring | 8.96 N/mm spring tension |
| Shaft | 20 mm |

| BUDGET CALCULATION | |
|---------------------------|------|
| Engine cost | 2000 |
| Hub motor with controller | 5000 |

| | |
|-------------------------|-------|
| Chassis material cost | 2000 |
| Bearing | 400 |
| Disc brake set | 1000 |
| Handle with fork | 1000 |
| Tyre with hub | 1000 |
| Nut, bolt& washer | 500 |
| Transport cost | 1500 |
| Welding and labour cost | 3000 |
| battery | 10000 |
| Other cost | 1000 |
| Total cost | 28400 |

CONCLUSION

This hybrid vehicle is most suitable for the factory use to toe the small goods. The higher authority people can took rounds inside a factory without any pollution. Disabled people can travel. Moreover the same technique and technology can be extended to the four wheelers also. Today the pollution of the world by the automobiles is increased more than the olden days.so the zero emission vehicles like electric vehicles are very popular now a day. But the problem of this type of vehicles are charging problems, battery failure problems and getting only low speed on electric vehicles. For this we introduced a hybrid vehicle which can run on both petrol and electrical at the same time. In future this can be extended in four wheelers also. This improves decrease in pollution and getting more speed and ecofriendly.



REFERENCE

1. Automobile engineering:- Dr. Kirpal Singh | 2. Automobile engineering:-Prof. K R Govindan , K K Jain | 3. Design Of Machine Elements:-Dr. vijayaraghavan,Dr.Vishnupuram | 4. Design Of Transmission System:-Dr.jalaludeen | 5. PSGDB Data Book |