Fabrication of Hybrid Bike Using Electric Motor

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***Abstract*- With growing oil prices and escalating environment worries, cleaner and supportable energy solutions are demanded. Present transportation contributes large amount of energy consumption and emission of pollutants. We mostly use the vehicles like bike, moped bike, car etc. due to this the air pollution also get increased. Due to pollution the diseases are also increased. The petroleum products such as petrol and diesel are non-renewable sources. It gets exhausted in future, so to prevent environment from pollution and to save fuels like petrol and diesel the hybrid are introduced. Any vehicle is a hybrid, when it combines two or more source of power. Hybrid electric vehicles are admired because of their ability to achieve related performance to a standard automobile while prominently improving fuel efficiency and tailpipe emissions. In this paper, hybrid vehicle technology has been fabricate, with Power split configuration having internal combustion engine and battery as the secondary running source.**

In this project we make a hybrid bike which runs in two mode.

Petrol mode:-The engine converts fossil fuel from the fuel tank into mechanical power. In this project first the bike will run with the help of petrol and the battery will charge with the help of alternator and generator.

Electric mode:-In this mode the electric machine converts electric energy from an electric energy storage system such as battery into mechanical power. After that supply of petrol will cut, Now bike will run with the help of battery which is charged previously with the help of alternator

INTRODUCTION

An emphasis on green technology is greatly demanded of modern cities. 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 bike that minimize the use of combustion engines by integrating them with electric motors. Such technology has a positive effect on the environment by reducing gas emission. The greatest challenge in research activities today is developing near zero- emission powered vehicles.

Hybrid vehicles rely on two or more energy converters for generating propulsion. Each energy converter is fed by an appropriate on-board energy reservoir. A hybrid electric vehicle (HEV) is comprised of an internal combustion engine together with one or more electric machines. The engine converts fossil fuel from the fuel tank into mechanical power while the electric machine convert electric energy from an electric energy storage system, such as a battery, into mechanical power. Unlike the combustion engine, an electric machine is usually able to reverse the process by operating as a generator thereby converting mechanical power into electric energy.

There is some problems on previous hybrid bike, the bike has to be charged externally and the charging stations are not available at large amount so there is main disadvantage. This factor we tried to solve in this project. In this project the bike will run in two modes.

- Petrol mode
- Electric mode

Petrol mode:- The engine converts fossil fuels into mechanical engine. Bike will run with the help of internal combustion and as well as the battery will charge with the help of alternator. So there no need to charge battery separately.

Electric mode:-In this mode the electric motor converts electric energy from an electric energy storage system such as battery into mechanical power. When bike was running on petrol mode the

battery was charged. Now the bike will run with the help of electric motor.

COMPONENTS

Alternator DC motor:- It is a multifunctional motor which produce energy Also it drives the wheel when we provide the power to the motor. It start producing energy when it will rotate about 2000 rpm or above. The starting speed of the motor has low and gets fast as per running more. When it will rotate about 2000rpm or above it will produce electric energy about 8-9 volt and this electric energy is stored in battery. Using this energy we will run the motor as result it will drive the wheel.

Fig: Alternator DC motor

Relay:- An alternator relay can be set up to divert power from a starting battery to another DC power source, sometimes called a house battery. On some cars and trucks, the alternator relay switches power to the alternator only when another circuit, like the ignition circuit, is live.

Fig: relay

Voltage regulator:- As the name implies it keeps the voltage at an appropriate voltage so that the battery stays fully charged and last as long possible. If the voltage is too high the battery will outgas and loose water. Also battery life can be reduced. Also hydrogen gas can be generated which could cause an explosion. If the voltage is too low the battery will not fully charge and may not start the vehicle. Also again the battery life can be reduced.

Fig: voltage regulator

Belt drive:- The V-belt acts as a transmission belt. Connecting the V-belt pulleys, it transmits the force from the engine to the ancillary components including the alternator.

Fig: V belt drive

Bike:- the main motive of our project is to provide secondary running source to the any two wheeler. In our project we choose the victor bike, but the setup can be attached to the any two wheeler.

Fig: bike chassis

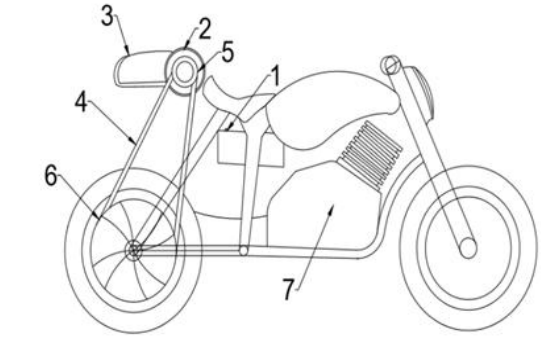
CONSTRUCTION

[1] The fig. shows the construction of the vehicle.

[2] We use the tvs victor bike and make a space to mount the electric accessories by removing the some chassis portion for mounting a motor. According to the size of motor we cut some amount of chassis part to fit and give support to the motor we welded some M.S plates and rods at the chassis where we make a space to mount the electric accessories

[3] Motor is mounted on the back side of the vehicle in the place of back seat.

[4] As we know the v belt drive is a one of the best and cheapest method of transmitting the power so we decided to use v belt drive mechanism. Motor has one pulley and another pulley is mounted on the wheel by counter boring, the ratio of pulley is 1:4. The motor is connected with regulator and relay. Motor has three terminal one positive one negative and one is for earthing connected which is connected with the positive terminal of the voltage regulator. And the negative terminal of the voltage regulator is connected with the negative terminal of the motor. The positive terminal of the motor is connected to relay and negative terminal is connected is connected by the battery and one positive terminal of battery is connected to the positive terminal of the relay.



Bill Of Material	
1	Battery
2	Alternator dc motor
3	Relay
4	V- Belt
5	Pulley 1
6	Pulley 2
7	Engine

Fig: Model Construction

WORKING

As we make the hybrid bike which has secondary running source as electric motor with traditional petrol bike, the bike runs in two mode. The bike will run initially with the help of petrol as like a normal bike, during petrol mode the bike will produce electric energy by the alternator DC motor which is mounted on the bike. When the bike will run in petrol mode the wheel starts rotating as well as the alternator starts rotating with the help of v-belt drive. As we know the function of alternator, when alternator rotate at a speed about 2000 rpm it start producing electricity, When it will rotate about 2000rpm or above it will produce electric energy about 8-9 volt and This electric energy is stored in battery. When there is need to run the bike in electric mode then this energy can be used to run bike.

SPECIFICATION OF COMPONENTS

Components	Specification
Alternator DC Motor	12 volt, 4000 rpm, L= 10 inch. D= 5 inch
Pulley 1	3 inch = 76.2 mm. section 'A' ,
Pulley 1	12 inch= 304.8 mm. section 'A'
V belt	Section 'A' L=60 inch
Battery	Amaron , 12 volt and
Relay	12 volt
ON/OFF Switch	12 volt
Nut Bolt	6,8,12 mm

ADVANTAGE

- It will run on petrol as well as electricity.
- The electric setup can attached to the any two wheeler
- Reduce the pollution.
- There is no need to charge battery externally.

LIMITATIONS

- Weight of bike is increased.
- The cost of bike is get increased.
- The weight carrying capacity is less during electric mode.

RESULT

The bike is running on petrol as well as on electricity. It starts charging during petrol mode and stored in the

battery as wee as it utilizes that energy to run the vehicle during electric motor.

CONCLUSION

Able to provide secondary running source to the vehicle. The setup of electric motor can be attached to the any petrol bike.

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