

Fabrication of Hybrid Scooter

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Abstract: In the modern trend automobiles have certain disadvantages such as fuel cost relative to mileage, pollution and less efficiency. The goal of this project was to implement the most efficient and less polluting vehicle. In our project the hybrid electric vehicle model combines the internal combustion engine of a conventional vehicle with the battery and electric motor of an electric vehicle, resulting in twice the fuel economy of conventional vehicle. It is a combination of two systems i.e. Petrol and electric system. Petrol system and the electric system are used for rear wheel Drive as per compatibility. This "HYBRID VEHICLE" will make use of both technologies accordingly. Running of vehicle on electric system will be free of cost and pollution free also. The attractive thing is that the batteries can be recharged from a domestic electric supply. There is a common throttle for IC engine and HUB motor which is controlled by motor driver/ controller. Equipment and cost analysis is done. It deals with the fabrication of scooter. The combination of the power makes hybrid scooter.

KEYWORDS: Hybrid drive, Electric drive, Retro fitment, Common throttle vehicle, Dual power driven vehicle.



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I.INTRODUCTION

To come up with the problems of hybrid vehicles system proposes implementing of rear wheel type drive.

In this type of drive train arrangement the factors are:

- Engine power,
- Electric Motor (DC brushless motor),
- Energy source (Battery).

A hybrid vehicle is a combination of energy storage system, a power unit, an electric motor, and a vehicle propulsion system. Primary options are petrol energy and secondary are electrical energy. Hybrids are of power units of typically spark ignition internal combustion engines (similar to those employed in conventional vehicles) for light-duty hybrid vehicles. Where the retro fitment of this kind of dual power supply for a same scotter has limits it only compatible with HOND: Activa, Aviator, Cilq, Dio, Navi. And HERO: Duet, Pleasure, Destini. These are the few compatible types of vehicles which are available in market which be customized to hybrid vehicle with the fixing of hub motor, common throttle, sine wave controller, battery, key switch.

Based on this process the fabrication of two wheeler is converted from basic petrol light duty vehicle to pollution free hybrid electric scooter which is of eco friendly with speed of 40kmph where the mileage which can be driven only by battery and motor power is 50km with a constant speed propelled by motor and further can be changed to IC engine with a switch with the help of common throttle.

STRUCTURE OF PAPER

The paper is organized as follows: In Section 1, the introduction of the paper is provided along with the structure, important terms, objectives and overall description. In Section 2 we discuss methodology. In Section 3 we discuss technical description. In Section 4 tells us about the future scope and concludes the paper with acknowledgement and references.

OBJECTIVES

The objectives of this project are

To improve efficiency

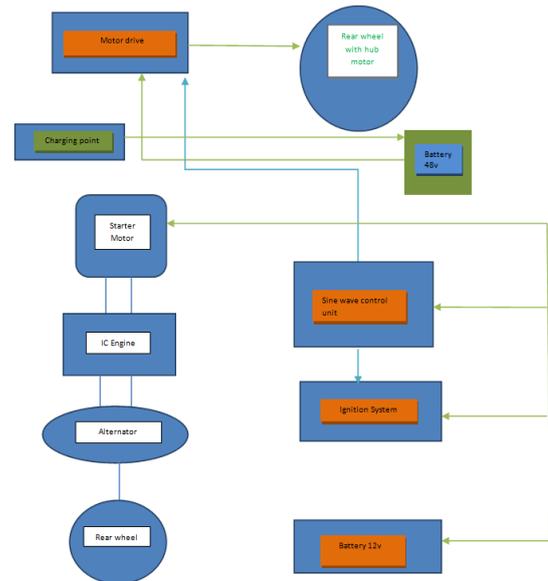
To decrease the fuel cost relative to mileage

To control the pollution is to be effect then our "HYBRID TWO WHEELER" is an aspect

METHODOLOGY

System proposes a solution by retrofitting existing scooters into hybrid electric which runs on IC Engine. Here scooter with engine capacity of 125cc petrol IC engine is used. Also, the rear wheel gets an electric hub motor. It becomes a conventional engine powering at the rear wheel and the electric motor driving wheel.

Flow Chart: 2. 1



Conventional engine is pretty inefficient during start-stop traffic. The engine uses a lot of fuel during such situations and reduces the mileage significantly. By using economy mode for these in which scooter will start and run on rear wheeled electric motor.

Hub mounted electric motor works during crossing traffic and does not need the fuel. Electric motors are much more efficient as they do not draw any power from the battery while waiting in traffic and idling.

Second mode is power drive mode. In this case, scooter will start and run on conventional IC engine, which is coupled with the rear wheel. This mode can be used for required condition when batteries are completely drained or if there is any problem in motor. The third mode is hybrid mode.

TECHNICAL DESCRIPTION

3.1 MOTOR

This is a basic hub motor with a power of 1.5Kw where this motor is fitted at the rear of the vehicle and controlled with the help of motor drive controller. It is a

brushless motor. The size fitment of the wheel is 10inch. Speed of this motor is an economy level which is 60kmph. It is a waterproof with working temp resistance is approx: 80 °C

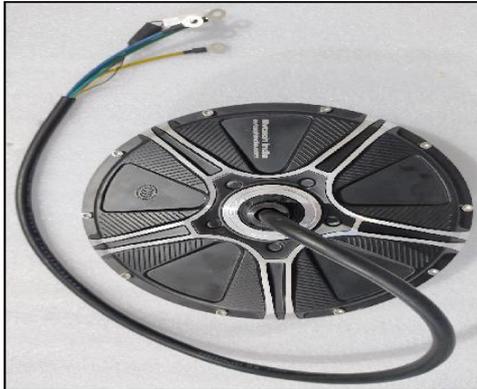


Figure: 3.1 Electric Motor

Table: 3.1 Electric Motor Characteristics

TYPE	Brushless DC
POWER	1.5Kw
WEIGHT	7 - 8kg
WHEEL SIZE	10 inch
SPEED	40 – 60km/h
TORQUE	30 N.m
MAX. WORKING TEMPERATURE	80 °C
EFFICIENCIE	85%

3.2 MOTOR DRIVE/CONTROLLER

Controller which is used for motor speed and the conversion of electric drive to petrol drive with compatible voltage of 48v / 60v.the maximum power distributed through this motor drive/ controller is 2.1Kw. it is also water proof with regeneration. It is sine wave controller.



Figure: 3.2 Motor Drive/Controller

Table: 3.2 MotorDriveCharacterstics

COMPATABLE VOLTAGE	48v / 60v
RATED CURRENT	35A
PEAK CURRENT	65A
MAX. POWER	2.1Kw
TYPE	sine wave

3.3 BATTERY

This is a lithium ion battery with a voltage capacity of 51.2v to 60v with the motor can run up to 40 to 60km at constant speed or consumption of energy. The time taken to recharge is 4 to 5hrs. It is a waterproof with weight of 14kilogram.



Figure: 3.3 Battery

Table: 3.3 Battery Characteristics

Voltage	51.2v 30Ah
Capacity	60v 24Ah
Range	45 to 55Km
Max.discharge current	35Ah
Charger	58.4v 6Amp & 73v 6Amp
Charging time	4 to 5 hrs
Max.working temperature	60°C

3.4 COMMON THROTTEL

This is a common throttle valve with is adjusted with the electric motor and petrol engine which is controlled by sine wave controller as per the requirement of fuel energy or electrical energy. Based on this the shifting of power transmission is changed with an ease without any huge changes just switch key is used for power transmission.



Figure: 3.4 Common Throttel

METHODOLOGY

Step1: Fixing of synchronized rear wheel drive.



Step2: Establishing the sine wave controller or motor drive controller.



Step3: Installing the lithium battery pack in the boot space with charging port



FUTURE SCOPE AND CONCLUSION

From this project we are able to reduce consumption of petrol and emissions from IC engine. Its is eco friendly and easy to cruise through traffic in city's based on the battery we can travel up to 40 to 55km. it is to switch between power sources

- Independent Electric and Petrol Drive
- No changes required in vehicle for Installation
- Easy to Install
- 60 km of top speed in pure Electric Drive
- Compatible with 48v & 60v battery pack
- Easily Detachable Battery Pack

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