Hybrid Two Wheel Drive Motorcycle with Range Extender

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Abstract—A hybrid two wheel drive motorcycle with range extender is a vehicle which relies not only on batteries but also on an internal combustion engine which drives a alternator to provide the electricity and engine is only used to drive the alternator. Hybrid electric vehicles combine an electric motor, battery and power system and with an internal combustion engine to achieve charging capacity for battery due to which better fuel economy and reduce toxic emissions. In HEVTWD, the battery alone provides power for low-speed driving conditions where internal combustion engines are used for charging the battery. In accelerating, long highways, or hill climbing the electric motor provide enough power. This allows a smaller, more efficient engine to be used. Thus the vehicle is best suited for the growing urban areas with high traffic.

Key words: Hybrid vehicle, HEVTWD, Hub motor, battery, alternator etc

I. INTRODUCTION

In various concerns there is a growing interest in electric and hybrid electric vehicles due to environmental concerns and fuel deficiency. Recent efforts are directed toward developing an improved propulsion system for electric and hybrid-electric vehicles applications. This project is aimed at developing the system new design philosophies of electric and hybrid vehicle propulsion systems to be implemented on an existing two-wheeler, using this concept two-wheelers can be effectively transformed to hybrids by which fuel efficiency can be achieved.

Extended-range electric vehicles (EREV) or range-extended electric vehicles (REEV) were designed to be run mostly by the battery, but have a petrol or diesel generator to recharge the battery when charge becomes low. However, range extension can be accomplished with either series or parallel hybrid layouts. In a series-hybrid system, the combustion engine drives an electric generator instead of directly driving the wheels. The generator provides power for the driving electric motors by charging batteries. In short, a series-hybrid is a simple vehicle, which is driven only by electric motor traction with a generator set providing the electric power. The Extended Range Electric Vehicle (EREV) is unique vehicle. The engine is used only when the battery charge is low and to charge the battery in such cases.

Two wheel drive system overcomes the limitations of single wheel drive. In this system power is given to both the front and the rear wheel. That is, if the rear wheel slips the power given to the front wheel is enough to move the motorcycle forward. With the two wheel drive system the load carrying capacity, traction and cornering ability of two wheelers are increased. It also results in unmatched hill climbing ability when compared with conventional motorcycles available in the market today. Because of this they are preferred for farm lands and military applications (reconnaissance missions). It is evident from the fact that a decade ago the two wheel drive motorcycles were limited to dirt races and mountain races. But now they are being wanted for farm and military applications and more companies are showing interest in the two wheel drive system on motorcycles.

II. WORKING METHODOLOGY

Our project will work according to these flowchart. Front and rear wheel drive are both provided with 500watts hub motor each. Hub motor gets the drive through control unit where on throttle position sensor suitable amount of torque is applied to both hub motor simultaneously. Power is withdrawn from gel batteries which are in series connection each of 12V thus wheel torque is control by control unit according to throttle position sensor. In this hybrid vehicle series combination of hub motor to both wheel and stationary engine where alternator is chain drive with engine. Engine drives the alternator through chain drive which charger the series of battery in less time. So by used of both primary charging through plug in it runs around 40km at speed of 45kmph. When battery is discharge secondary charging method via alternator is used which charge with a 1 hour. So again we can operate for travelling more 40kms, in those places where charging facilities not available.

So here there is reduction in toxics gaseous and we get large range of travel.

![Fig. 1: Block diagram](image)

III. CONCLUSION

The technology of hybrid petro electric bikes is an emerging field in now a days and the total cost on these types of vehicles very profitable for the future and also solves the issue of natural resources scarcity and is an ecofriendly 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 liters of gasoline and fully charger battery. This can be used mainly in city, metro Politian cities and in rural area where the sources of charging is less. As the power is on both the wheel high torque feel while riding and because of it can climb the slope easily. Better riding capacity on off-road and on-road surfaces. In coming future due to scarcity of fuel this kind of HEVTWD will be beneficial for us.
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