

INTRODUCTION

One of the greatest developments of modern technology is the development of Internal combustion Engine vehicles. Automobiles have made great contributions to the growth of modern society by satisfying its needs for mobility in everyday life. And the rapid growth and expanded industrial band. making it the backbone of the world's economy and employing the greatest share of the working population.

However, the rapid growth of internal combustion engine vehicles and their use has caused and continue to cause many serious threats to the environment and the human race. Environmental pollution like air pollution, global warming and meteoric depletion of earth petroleum resources are now the problems of supreme concern. more and more rigorous emissions and fuel consumption regulations are invigorating interest in the development of safe, clean, and high efficiency transportation. And from that it has been well recognized that electric hybrid electric, and fuel cell powered drivetrain technologies are the most encouraging solutions

To the problem of transportation in the future therefore, to meet the comprehensive technological changes many Indian and American engineering schools have introduced academic training on electric vehicles (EV's) and advanced vehicle technologies.

The research and development from recent decade in clean, high efficiency and safe transportation have proposed to replace conventional vehicles with electric vehicles and hybrid electric vehicles in future. Unlike vehicles with combustion engines, electric vehicle do not produce any harmful exhaust gases during population. This makes electric vehicles and hybrid electric more environmentally friendly than internal combustion engine vehicles. Electric vehicles (EV's) use an electric motor for propulsion and the energy source for the traction includes fuel cells, chemical batteries, etc. Electric vehicles have a good deal of advantages over conventional combustion engine vehicle like the absence of emissions, high efficiency, petroleum independence and safe and effortless operation. earlier electric vehicles on the whole, were mainly converted from the existing internal combustion

LITERATURE SURVEY

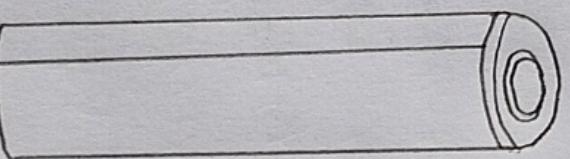
Numerous studies have been done internationally to understand consumer preference, designing better batteries and better powertrain designing, energy generation, etc. for electric vehicles globally. Of which the factors include the cost of the EV, time to recharge the battery, battery cost and driving distance per charge. Materials for solid-state batteries, the US Department of Energy (DOE) is working with its partners in the public & private sectors to research, develop, and install technologies that enhances the performance of electric vehicle. The below statistical data shows the number of searches done on electric vehicle so far. There has been significant progress in numerous aspects of the development of electric vehicles and the use of technology comparably. The efforts on research have also increased which has caused a significant increment in new jobs related to electric vehicles. The government of India recognises electric vehicles as a sustainable mobility policy in a move for a cleaner environment.

THEORETICAL ANALYSIS

The designing specifications and efficiency of the motor for the electric vehicle being built by evoka technologies having a total weight of 40kgs are in image provided by the company

CELL DESIGNING

Most of the companies manufacturing electric vehicles have shifted towards lithium-ion batteries because of their high capacity and fast charging ability and various other advantages the cell designed by evoka technologies is a compact cell design that can store a high amount of energy shown



BATTERY PACK DESIGNING

Evoka technologies built a battery pack with high cooling performance and with battery structural safety. with the CATIA designing tool, the schematic cross - section of the battery pack with cell holders is shown

CAR DESIGN

Evoka technologies came up with a very subtle yet simple car design . the below the car design which has been rendered via the catia designing the electronic vehicle industry is rapidly evolving towards better and safer designs so that consumers prefer these electric vehicles for environmental safety . the lithium-ion cell for battery packs is drawing attention towards their various advantages like fast charging capability , safer , and has a high charge density . the below analysis the ranges provided by the top - selling electric vehicles (ev's) in the market

RESULT

An electric vehicle powertrain is responsible for taking energy stored in the vehicle's battery system and supplying it to the motor the amount of power that it takes to move a fully-loaded vehicle is enormous and delivery needs to be instantaneous and predictable. This needed research on various aspects of technology including using the perfect type of battery and powertrain design planning. We as a team researched using the perfect type of battery and powertrain design planning. We as a team researched the type of batteries in different consumer electronics has proved to be a great storing device. lithium-ion batteries have a higher energy density than lead-acid batteries and hence can be designed into smaller sizes while retaining the same storage capacity and hence a special car structure can be designed.

DISADVANTAGES & ADVANTAGES

- This report primarily focuses on the research design and development of the powertrain of an electric vehicle.
- The electric propulsion systems are the heart of electric vehicles
- The major components of a powertrain of an electric vehicle include some important core parts such as a battery pack
- Apart from that there are multiple software and hardware components in an electric vehicle
- the communication between several ecu's is carried over CAN protocol of communication
- Many notable electric vehicle companies such as Tesla have their own lithium ion battery and many notable electric vehicle companies such as battery manufacturing

- Battery electric vehicle use lithium-ion battery cells due to energy storage
- lithium-ion batteries the best in use for any electronics, electricity, vehicles and various aerospace applications.
- The lithium-ion battery has good high-temperature performance too
- This means that the batteries hold a lot of energy for their weight
- which is vital for electric cars. We have used lithium-ion cells for the battery pack in this project
- the powertrain system
- the below representational image of a powertrain platform displays various components of an electric vehicle powertrain system

APPLICATIONS

We have considered various types of electric vehicles existing at the moment across the globe for this study. The study behind electric vehicles is to replace the conventional internal combustion engine vehicles with an electric motor that gets its power from the energy stored in the forthcoming future making it a season to develop effective and safe batteries and powerplants for EV's. This internship program involved extended and individualized support to each intern through daily and support to each intern through daily and meeting with weekly work submissions.

The urgent need to cut down carbon emission is an expeditions move towards promoting invigorating interest in the development of safe, clean, and high efficiency transport of these solutions surge as expected the need for better methods for storing electrical energy. Will increase various research are focusing on adapting today's lithium-ion battery to make versions

Energy for their size and weight. To fill make gaps evoke came out with a very Identifid and compact cell design that would be safer. smaller and can store more energy

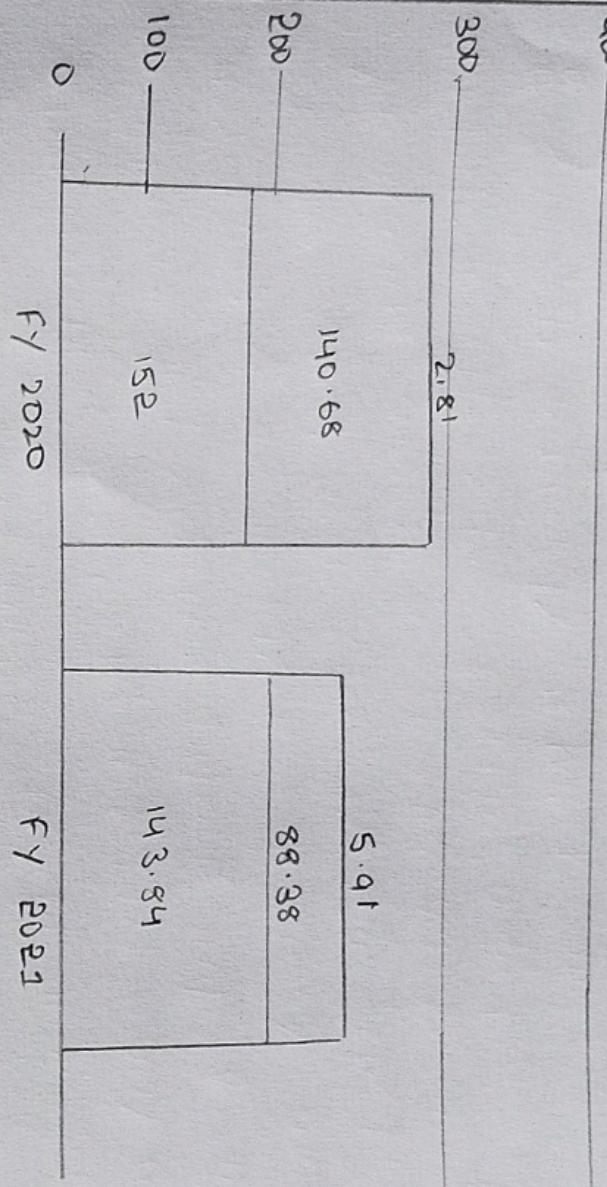
The vehicle steering principle can be understood by a basic principle. That is the principle of wheels. The perpendicular lines from the front wheels while the vehicle is at rotation should meet the rear wheel axis at a common point. This principle is called the principle of steering. That is for perfect steering left and right wheel turning angles should be different. This steering mechanism should be different. This steering mechanism in modern vehicles is carried out by rack and pinion joints mechanism which manages to steer the vehicles. Power steering is an advanced form of the steering mechanism. The overall effort required by the driver is reduced in this system through a hydraulic or electric control.

CONCLUSION

The recent initiatives and various subsidies by the Indian Government will help push the transportation with the increase in carbon and other hazardous gases more and more pollutant are causing various health - related issues which are of major concern. And with the increases in technology, it has become easier vehicle to address these problems with promising yet efficient solutions to electric vehicle. The electric vehicle is a relatively new concept in the world of the automotive industry. Many scientists and scholars hope to improve the environmental conditions and find many more methods to build more efficient and safer modes of transportation while to combat these from their studies. Electric vehicle have a good deal for advantages largely electricity is less expensive than gasoline and petroleum with electric cars the cost of gas each year can be reduced to a considerable percentage the biggest advantage of a full battery

Electric vehicle is that it does not emit any harmful gases as 100% eco-friendly electric vehicle are quite popular and are growing in popularity. It is nearly three times as efficient as cars with an internal combustion engine

Sales of electric vehicles across India



A good deal of research and innovations are needed to fill the gaps that lack today and maintain the best in the industry. Electric vehicle are a healthier alternative to the environment but a lot of research and studies are required for better batteries and battery management systems.

FUTURE SCOPE

EvoKa technologies in an electronic vehicle building platform working on futuristic electric vehicle designing and development . considering various type of environmental problems because of conventional internal combustion engine vehicle across the globe . EvoKa is focused on replacing these vehicles with electric motor vehicles powered by batteries for all growing demand for technology and environmental friendly methods . EvoKa Pvt is targeted to rely on fuel cell - powered drive train technology which are more encouraging and promising solutions

An electric vehicle powertrain is responsible for taking energy stored in the vehicle's battery system and supplying it to the motors . the amount of power that is takes to move a fully - loaded vehicle is enormous . and delivery needs to be instantaneous and predictable . this needed powertrain design planning .

We as a team researched the type of batteries that can be used in an electric vehicle. Traditional lithium-ion batteries continue to improve but they have limitations in because of their structure. the current use of lithium batteries in different have a higher energy density than lead-acid batteries and hence can be designed into smaller sizes while retaining the same storage capacity. And hence a special car structure can be designed.

Applying various electric vehicle concepts including steering principle and mechanism practically

Differentiating various type of electric vehicle based on their powertrain system based on their powertrain system understanding of electric vehicles An electric vehicle has 60% fewer component than the powertrain of an internal combustion engine

STUDENT SELF EVALUATION OF THE SHORT - TERM INTERNSHIP

To understand the principle of differentials there is a very basic concept that while taking a turn right turn , the left wheel has to travel more distance than the right wheel and hence it has to rotate at a higher speed than the right wheel . And if these wheels were connected by just a solid shaft , there would be slipping between the wheels to take a turn . And hence this is where the differential comes into action . the mechanism in the differential helps the wheels to rotate at different speeds with respect to each other while transfer power to both wheels . the image below shows a basic section of an open differential and its parts