

Development & Fabrication of Electric Car: A Review

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Abstract-Due to the problems caused by the gasoline engine on the environment and people, the automotive industry has turned to the electrical powered vehicle. This paper explains how an electric vehicle works. The paper describes the development and the comparison of different part of components.

I. INTRODUCTION

The mid-1900s saw a need for alternative fueled vehicles to reduce the problems of exhaust emissions from internal combustion engines and to reduce the dependency on imported foreign crude oil. During the years from 1960 to the present, many attempts to produce practical electric vehicles occurred and continue to occur.

Electrical vehicle (EV) based on electric propulsion system. No internal combustion engine is used. All the power is based on electric power as the energy source. The main advantage is the high efficiency in power conversion through its proposition system of electric motor.

The purpose of this report is to describe the technology used to produce an electric vehicle and explain why the electric engine is better than the internal combustion engine. It includes reasons why the electric vehicle grew rapidly and the reason it is a necessity to better the world today. The report describes the most important parts in an electric vehicle and hybrid vehicle. It compares the electric to the hybrid and internal combustion engine vehicle. It also includes the future of the electric vehicle.

Electrical power is one of the important sources of energy in our daily life. It is used in all areas for the rapid development of the economy. The efficiency of the related production systems and power transmission system is required for the sustainable development of the economy and environmental protection

II. LITERATURE REVIEW

Flah Aymen, Chokri Mahmoudi [1]-To increase the vehicle autonomy, managing the power inside the car is one solution to save energy; the idea is based on the minimization as much as possible of the electrical energy consumed when the car is in motion

K.W.E CHENG [2] -In this author describes the development and the comparison of different part of components. The major components in battery technology, charger design, motor, steering and braking are examined. The paper finally shows some electric vehicle prototype as a conclusion of the papers.

Ann Holms[3] - Author describes the problems caused by the gasoline engine on the environment and people, the automotive industry has turned to the electrical powered vehicle. This report explains how an electric vehicle works and compares the electric vehicle to the internal combustion engine and hybrid vehicle.

Fan Zhang et al.[4] - This paper reviews the technical background of electric vehicle technology and its applications. A number of important concepts frequently used in this field are explained, and the technical details, including the theoretical principles, are given alongside practical systems pertaining to several kinds of electric charging piles

C. C. CHAN[5] - This paper will provide an overview of the present status of electric and hybrid vehicles worldwide and their state of the art, with emphasis on the engineering philosophy and key technologies. The importance of the integration of technologies of automobile, electric motor drive, electronics, energy storage, and controls

Ryan Sprague [6] - The purpose of this paper is to describe current uses of battery technology for internal combustion engine vehicles and newer hybrid electric vehicle and battery electric vehicle alternatives. This paper will also discuss the benefits and challenges to alternative vehicle adoption. As battery technology and charging infrastructure continue to advance, and drivers become more informed about these technologies, adoption rates for alternative vehicles have the potential to increase dramatically, leading to a dramatic transformation of the auto and petroleum industries.

C Iclodean et al. [7] - Battery powered Electric Vehicles are starting to play a significant role in today's automotive industry. There are many types of batteries found in the construction of today's Electric Vehicles, being hard to decide which one fulfills best all the most important characteristics, from different viewpoints, such as energy storage efficiency, constructive characteristics, cost price, safety and utilization life. This study presents the autonomy of an Electric Vehicle that utilizes four different types of batteries: Lithium Ion (Li-Ion), Molten Salt (Na-NiCl₂), Nickel Metal Hydride (Ni-MH) and Lithium Sulphur (Li-S), all of them having the same electric energy storage capacity. The novelty of this scientific work is the implementation of four different types of batteries for Electric Vehicles on the same model to evaluate

the vehicle's autonomy and the efficiency of these battery types on a driving cycle, in real time, digitized by computer simulation.

Nasser Hashernnia and Behzad Asaei[8] - In this paper, author studied different electric motors are studied and compared to see the benefits of each motor and the one that is more suitable to be used in the electric vehicle (EV) applications. There are five main electric motor types, DC, induction, permanent magnet synchronous, switched reluctance and brushless DC motors are studied. It is concluded that although the induction motors technology is more mature than others, for the EV applications the brushless DC and permanent magnet motors are more suitable than others. The use of these motors will result in less pollution, less fuel consumption and higher power to volume ratio. The reducing prices of the permanent magnet materials and the trend of increasing efficiency in the permanent magnet and brushless DC motors make them more and more attractive for the EV applications.

X. D. Xue et al. [9] -In this study, six kinds of the drivetrain systems of electric motor drives for EVs are discussed. Furthermore, the requirements of EVs on electric motor drives are presented. The comparative investigation on the efficiency, weight, cost, cooling, maximum speed, and fault-tolerance, safety, and reliability is carried out for switched reluctance motor, induction motor, permanent magnet brushless dc motor, and brushed dc motor drives, in order to find most appropriate electric motor drives for electric vehicle applications. The study shows that switched reluctance motor drives are the prior choice for electric vehicles.

Georgios Koumartzakis et al. [10] - The automotive chassis is one of the most important structures of any self-propelled construction because of its multifaceted role on vehicle dynamic behavior. This paper presents the design and the development of a chassis, for the one-seated prototype electric vehicle “Louis”, developed by

Technical University of Crete Eco Racing (TUCER) team. The main target is to evaluate chassis deformation, based on static and modal analysis, in order to reduce weight and at the same time achieve adequate vehicle operation in a demanding low energy consumption race. A modal analysis is also set up and run, to determine the natural frequencies and the mode shapes of the chassis, so to partly understand the dynamic behavior of this structure. All above mentioned analyses are conducted for the 2014, 2015 and 2016 vehicles chassis. The results obtained provide a valuable insight on the evaluation procedure, final weight and factor of safety calculated. A significant reduction of weight is achieved and presented through the comparison of the three chassis versions.

Wangyi Mo et al. [11] - Electric vehicles (EVs) have become an efficient solution to making a transportation system environmentally friendly. However, as the number of EVs grows, the power demand from charging vehicles increases greatly. An unordered charging strategy for huge EVs affects the stability of a local power grid, especially during peak times. It becomes serious under the rapid charging mode, in which the EVs will be charged fully within a shorter time. In contrast to regular charging, the power quality (e.g., voltages deviation, harmonic distortion) is affected when multiple EVs perform rapid charging at the same station simultaneously. To reduce the impacts on a power grid system caused by rapid charging, we propose an optimal EV rapid charging navigation strategy based on the internet of things network. The rapid charging price is designed based on the charging power regulation scheme. Both power grid operation and real-time traffic information are considered. The formulated objective of the navigation strategy is proposed to minimize the synthetic costs of EVs, including the traveling time and the charging costs. Simulation results demonstrate the effectiveness of the proposed strategy

IV REFERENCES

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