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Review on Electric Vehicles and Their Components

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ABSTRACT
The Electric Vehicles and there Components is the peer- review paper that covers all the studies related to battery, accelerometer, hybrid vehicles, and direct driven wheel motor vehicles comprehensively. Electric Vehicles (EV's) are going to be the future of the automobiles thus, batteries are going to play a pivotal role in EV's. It is very challenging part because some of problems like scarcity of charging stations and less powerful batteries. Thus, to overcome these issues there is a need of drive train system which will optimize the power to increase the mileage per charge. This review paper associates with the different research papers to clear the concept of different sensors, motors and batteries to design the drive train system for the same and also to know the amount of work done on the electric vehicles.

KEYWORDS: Battery Management System, Concept of Electric Vehicles, Various Sensors used in Electric Vehicles, Wheel Hub Motor.

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I. INTRODUCTION:

Electric vehicle, furthermore called an EV, uses in any event one electric motors or balance motors for impulse. An electric vehicle may be controlled through a gatherer structure by power from off-vehicle sources, or may act normally contained with a battery, suncontrolled sheets. Electric autos are a more ecologically friendly choice than conventional vehicles since they produce no tailpipe outflows. Be that as it may, they are not viewed as carbon impartial except if the power they run on is produced from a sustainable source. There are such a large number of points of interest of the electric vehicles over ordinary ignition motor vehicles. For instance, no tail pipe discharges, smoother running, less support in view of lesser moving parts and so forth. The present EV have a force framework which comprises on batteries. This battery is really a gathering of associated cells which are again associated again to one another arranging a gathering of a few of them with the goal that all together arrive at the best possible measure of voltage, ebb and flow and force required to control the electric engine or engines which, by the transitional activity of an engine driver, moves the vehicle and supply further vitality to other vehicle's frameworks, for example, lighting, cooling, data frameworks, and so forth. By taking an immediate move in the direction of the completely electric vehicle is an extremely testing task on the grounds that the mileage of the electric vehicle per charge is less when contrasted with the mileage of the burning vehicles. To adapt up to this disadvantage it is mandatory to structure and actualize another drive train framework.

II. LITERATURE REVIEW:

Hiroshi Shimizu etal. [1]Experimented using the concept of Energy-saving electric vehicle (ESEV). They have built up an electric bike by executing new innovations. A motor without brushes that utilizes an uncommon tooth cobalt-magnet was set inside the back wheel to use the drive framework. The most extreme speed was 65

km/hr and the range is 56 km in 30 km per hour steady speed driving. They believe that if the new technology were added then the EV will give better performance. The idea of ESEV is to diminish power losses in every power utilization procedure by utilizing new advances**.**

Chung-Neng Huang etal.[2]A hybrid electric motor (HEM) with a straight drive wheel motor is projected in this paper. A Hybrid Electric Motor with minor power train modification is proposed right now tackle the different issues. The proposed HEM has two force sources, one is an IC motor and second is anelectric wheel engine.They have designed this HEM in such a way that the System will get a significant amount of power from the battery only. Here, in this case, the engine will act as a sub-power source if the system demand more power then it will get from the engine. Because of this, the engine will work efficiently it will run at higher efficiency thus will improve the fuel economy and results in fewer emissions. In this modified framework they have utilized internal combustion engine, continuously variable transmission, Centrifugal clutch, final drive, and an additional electromechanical clutch. This electromechanical clutch is fitted in the middle of the engine and the continuously variable transmission to such an extent that the HEM can charge the battery in any event, when it is halted for the traffic. A standard base structure is utilized to plan the power split controller.

Clifford L. Hayden [3] studied the lead-acid batteries. He found that by following the 9 different battery maintenance activities can increase the life of the batteries as well as increases its performance. He proved that the lead-acid batteries are powerful enough to provide sufficient power for electric vehicles. From his studies, he concludes that ordinary lead-acid batteries can keep on playing out the mission all the more productively through the advancement of improved management systems. There are different battery support exercises that influence the unwavering quality and the life of traditional lead-acid batteries if upkeep strategy followed appropriately, at that point the exhibition could be expanded by as much as 30% in a real case.

Mark Harrison etal.[4] performed experimental studies to reduce the number of accidents by making a safety system with the aid of the vehicle safety control system. In this safety system, firstly they used an inertial sensor (combination of the yaw rate sensor and Pitch sensor). They are very sensitive and accurate. The purpose of this sensor is to detect the sideslip. The Vehicle angular velocity and acceleration are measured by yaw rate and acceleration sensor. They developed a new acceleration sensor by using the micro-electrical mechanical system to increase its work intensity in which sensor chips are stacked together on ceramic packages. The sensor chip measures the acceleration and the circuit is designed in such a way that it transfers the information in the form of voltage. Finally, he examined the newly developed sensor and old sensor and he found that the output of the sensor which he designed was very good and sensitive and can be able to use that in the vehicle safety control system.

Sonal Awasthi etal. [5] Designed a MEMS accelerometer framework for the investigation of the movement. Fundamentally, the sensor was miniaturized scale manufactured which is called MEMS. The reason for structuring this sensor is to quantify the speeding up in the assortment of utilizations. They utilized this MEMS accelerometer to get the signs in three directions from the subject and afterward signal obtaining of three directions is finished by utilizing information procurement gadget (DAQ) and microcontroller. For the yield of the three pivot, they utilized the MATLAB and GUI (graphical UI) screen.

Esther Salmeron-Manzan et al. [6] proposed an examination of the development of bicycles from the customary ignition to electric bicycles. Their chief target was to recognize how by and large research on the electric bicycle was made and, especially, around which scientific degree was it gathered, to finally perceive the key examples in the field. They finished their examination which was totally based on the Scopus database. In this procedure the analysed every study regarding the electric bike till the year 2017.Their original copy shows that the worldwide research drifts about the electric bike are expanding and that it ought to be viewed as a method for economical urban vehicles and will in this manner add to vitality sparing and manageable vitality.

Roger T. Simpson et al. [7] A mix pressure/temperature piezoresistive sensor has been created for the car business with a working temperature of - 40^{o} C to +150^{o} C. The sensor is planned so that it gives both weight and temperature signs to outside gadgets. The dynamic outside hardware is situated in a zone away from the high temperature of the transmission and motor and in this way not influenced by their warmth. The sensor is mounted somewhere inside a transmission for progressively precise and responsive weight and temperature detecting.

Johann willberger et al. [8] They had done an experimental study on the different motors types which are used in the wheel hub applications. In this study, they mainly focused on the potential and energy efficiency of the motor. For the experiment, they used Electric and synchronous motors, the comparison is done for the consumption of energy

at various driving cycles between the electric motor, the synchronous motor with an interior mounted magnets and a synchronous motor with a surface mounted magnet. The moto of this experiment is to find the best suitable and efficient electric motor for the wheel hub appliance at different roads like city road, highways and family cycle.

Ilya A. Kulikov et al. [9] proposed a strategy to examine an exchange off between IC motor and electric battery sizes which is the basic issue of plugin hybrid and range-expanded electric vehicle plan. This method is used to describe the set of maps from the batch simulation of hybrid vehicle. Maps set up a connection between ICE power, fuel utilization, electric vitality utilization, and driving scope of a vehicle. To describe the driving cycle simulations, two things are used first is the mathematical model and the second is a hybrid power train. This method also helps to show the constraint of the battery's current and its voltage. Because of this, it becomes easy to identify the performance of the electric drivetrain and thus, also used for the selection of the ICE power.

David Hobbs et al, [10] proposed a method of safe working techniques in a global marketplace for the workers who have to do the risky jobs in their field. Jobs like battery disabling, storage, removal, disassembly, and shipping. For the safety reasons it includes different technologies and working practices with legal constraints for battery dismantling and shipping from one place to other. They also elaborated on how each and every detail of the safety working processes are made available to the workers who are working in the vehicle recycling community and how it can be improved to increase the safety in future.

Polychronis Spanoudaki et al. [11] led an exploratory examination to bring down the fuel utilization and increment the independence, various kinds of motors and force transmission parts are researched. They led a test utilizing reasonable conditions, their testbed was the custom form urban vehicle ER16. The powertrain is an electric engine which utilizes as a force source an H2 energy unit. Concerning execution, the vehicle can accomplish higher speeding up utilizing the gearbox, relating to marginally bring downtime expected to finish the two laps in the track. From the test, another key finding was that rigging change speed altogether impacts the vitality utilization of an electric vehicle, and it very well may be decreased up to 4% or raised to 11%, in this manner, they presume that there is no proportionate use of on-street testing with various transmission types and a point by point examination of their impact.

Eric Jelinski et al, [12] conducted testing on the electrical vehicles. The test is conducted on the Nissan truck and for the purpose of the test they converted the truck from the combustion power train to the electric power train. The electric truck is designed in such a way that is should operate properly in the cold climate conditions. After the test, they concluded that the electric vehicles are the best suitable for all the seasons and especially in the cold climate conditions, because unlike the combustion vehicle it does not have the starting problem like engine warm-up and cold starting.

Zaghba et al, [13] from the trial consider they found that the photovoltaic (PV) frameworks give a solid answer for the issues of access to power in secluded zone. The work introduced right now on the investigation, execution and the executives of a PV/battery/charge to picture the electrical parameters of the framework including flow, voltage, and condition of charge of the battery, the voltage, and flow of the PV generator. At first quarter vehicle model was created to investigate dynamic suspension abilities and brought forth the ideas of skyhook damping and quick burden levelling which are presently being created toward real, huge scope creation applications. Further, the half-vehicle model including pitch and hurl modes was concocted to recreate the ride qualities of a streamlined entire vehicle, which prompts critical improvement in ride and taking care of.

Cheng Zhang et al, [14] played out exploratory research on bicycles utilized in shanghai. They found that the motorbikes have turned into a noteworthy supporter of encompassing air contamination in Shanghai. According to conquer this issue they chose a plugin bicycle (e-bicycle) as an option over the combustion bikes. After doing this, they did a life evaluation assessment for these two systems based on vitality usage and conditions. From this LCA, they got an outcomes that e-bicycles are worse than engine bicycles since e-bicycles creates progressively strong squanders, fermentation potential, and HM than the motorbike, because of electric force creation. But unlike the combustion motorbikes, the e-bicycles spends less energy in its life cycle, therefore it has less global warming potential, transmits less biochemical oxygen demand, less chemical oxygen demand, and less hydrocarbon into water. In this way, they presumed that while executing an electric bicycle plan, the shanghai government should bolster impelled batteries and clean coal ended power plant.

Bruce R. Laumeiste, [15] examined how the parts of general electric vehicle and its system was created, they additionally concentrated on their moto behind this, the conclusive outcome and the overall conclusion of a general electric vehicle. They have studied every detail of general electric vehicles from its styling till its performance. From the experiment, they found the power framework

necessities, execution and furthermore examined the financial matters of a few potential electric vehicles just as an investigation of the potential power sources for electric vehicle propulsion.

PS Satyanarayana et al, [16] built up a two speed programmed transmission (AT) to propel the essential productivity and execution of electric-bikes. They built up straightforward frameworks, minimized and financially savvy and which gaveincreased in productivity of an electric-engine. While building up this framework, they have completed virtual re-enactments of an electric vehicle for various driving conditions and ideal transmission proportions were resolved. Lastly, they effectively built up the framework which consolidates prevalent moving exactness, high transmission proficiency with expanded evaluation.

Edward Heil et al, [17] talked about the GMI equation helping group. The Formula Lightning is an interesting rapid electric vehicle. They accept that by partaking right now, can build his latent capacity and abilities in plan and other testing designing assignment. They talked about the plans and strategies which are made by GMI understudies to construct the equation vehicle.

John S. Reuyl, [18] built up a trial XA-100 5-traveler 4-entryway Chevrolet Corsica that has been retrofitted with an electric-engine drive framework, batteries, and an on-board motor/alternator framework. They have planned XL-100 to go on around-town and short expressway drive stumbles on battery power alone with zero fumes discharges (zero-outflows vehicle (ZEV) and to go as an ultra-low-emanations vehicle (ULEV) on long separation trips utilizing an on-board motor/alternator (i.e., an assistant force unit (APU)) for electric force. After the effective plan of XL-100, they found that it has equaled or surpassed the entirety of its quantitative destinations. E. H. Hietbrink et al, [19] portrays about the test program which was about the EV to evaluate the toughness of nickel-zinc batteries and the test was held at general motor proving ground. The nickel-zinc batteries are considered as the contender because of their structure and working qualities in the case of urban passenger vehicles.These fuse a better than average express essentialness for improved range, high unequivocal power for good accelerating and gradeability, low volume for packaging flexibility, a respectably little effect of lower including temperature on execution, and small help necessities. General engine collaboration prevails with regards to lessening the anticipated expense and in essentially expanding the cycle life of full-size 150 Ampere hour Nickel-zinc cells intended for an urban passenger vehicle uses.

Fabrice Le Ber et al, [20] introduced a worldwide approach to structure an electric vehicle and to assess the affectability of estimating procedure to the suspicions and the prerequisites considered. While planning this vehicle different structures and force trains are considered. At last, the planning stage prompts a last electric powertrain adjusted to the entire prerequisites while advancing its worldwide proficiency and its measurements.

III. CONCLUSION:

Electric autos are certainly more earth neighbourly than inner ignition vehicles. Batteries are being built to have a long life. It is believed that the future will look more splendid for electric vehicles by using the essential sources like power devices and sustainable energizes. It is firmly accepted this is a creative advance towards the mileage of the electric bicycle and furthermore towards the green condition. The progress that Electric vehicles industry has done is not only impressive but it was highly necessary as global pollution and green house gasesare the biggest problem nowadays and automobile are also considered as the major reason behind that.After so many analyses, it is seen that electric vehicles perform at their best level. The electric vehicle have various advantages but the major issue is their cost, combustion vehiclesare less costly and convenient. Possibly throughout the following decade, technological headways and arrangement changes will help facilitate the progress from conventional fuel-controlled vehicles.

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