

A Review on Design and Fabrication of Foldable Two Wheel Electric Vehicles

Kartavy R. Patel¹, Harsh M. Vanerkar², Harsh P. Patel³, Viranchi H. Shastri⁴

^{1,2,3}U.G. Students, Department of Mechanical Engineering, U.V. Patel College of Engineering, Ganpat University, Gujarat, India.

⁴Professor, Department of Mechanical Engineering, U.V. Patel College of Engineering, Ganpat University, Gujarat, India.

Abstract - Modern era demands the modern technology and high tech machines. Due to increase in the rate of petrol and diesel, it seems to be costly to run a vehicle using the fuel. Therefore, electric vehicle is an alternative for fossil fuel vehicle. Due to increasing population, there will be increase in traffic and shortage of parking space. So we are developing foldable electric vehicle, which is easy to fold and can be carry anywhere we want. It runs on lithium ion batteries, which do not harm the environment, and gives better efficiency than petrol/diesel vehicle. E-bikes are light in weight, efficient, compact, silent and zero emission. It is the future vehicle of urban mobility.

Key Words: - Electric Vehicle, Foldable and Portable, Lightweight, Rechargeable and removable battery pack, Urban Mobility.

1. INTRODUCTION

Foldable Electric Vehicle (FEV) - A folding vehicle is design to fold into a compact form, easily carry in transport as urban mobility.

1.1 Why Need an Electric Vehicle?

Now days, increase in number of automobiles, people will require space for driving as well as for parking. As we know, there is limited space available and, they are causing traffic and shortage of required space for parking because highly demand of the vehicles

In today's scenario, India is the fifth polluted country in the globe. Moreover, petrol and diesel prices rich its limit. Use of an automobile is polluting the Environment and stringent regulations to curb the vehicular pollution is getting stricter.

Use of electric vehicles it does not create pollution and does not required further fuel cost. Electric scooter is a battery-operated vehicle, which is economical with low maintenance cost. Electric vehicles contains lithium ion battery. It has long life and requirement of charging time is less and long battery life. Electric two wheelers use the rechargeable battery that converts the electrical energy into

mechanical energy. Using of rechargeable or removable battery it can be charge anywhere and anytime. The battery of an EV can be charge easily using a power connection. The campus environment especially that of the more established universities has entered the public consciousness as being a heaven for bicycle use. In addition, foldable and portable vehicles are used in many countries. Using of foldable electric vehicle it required less space for parking. It can be ride and fold easily using of foldable mechanism. Most electric vehicles have single fold mechanism. Foldable vehicles are lighter in weight so it can be carry, fold and transport easily.

2. LITERATURE REVIEW

Shlok Desai, Kavan Mehta, Zinal Kheni, Naitik Bhatt, Rahul Patel (2019) [1] From this research paper we found that after designing and modelling analysis of presented foldable electric bike we found that it will help manufacturers of foldable electrical bike to reach their goal with low cost, lighter in weight and an electric bike that can operated rough roads. Due to exponential increment of pollution and population foldable electric bike will help to reduce pollution also, will become more convenient mode of transport. Now days problems like fuel, traffic and parking as well as some global can be solved with the support of this revolutionary foldable mechanism. In addition, it will help to solve global problems and will able to help people to improve their lifestyle easily. Due to its compact and portable mechanism user can travel anywhere and able to fold vehicle according to situation and requirement.

B. Sreelakshmi, C Raghvendra, MD Nashad Sultan (2019) [2] It is a very interesting project because it includes the self-charge battery with the help of solar energy. It is a completely eco-friendly and helps to drive in both urban and rural area. It can easily move on concrete roads, mud roads and asphalt roads. It also includes AC charger for emergencies or in a cloudy weather. One can use it in college, industrial area, etc. As it is fully solar operated there is no use of fossil fuels which saves the lot of money of the government.

Jayesh S. Renge, Ronak P. Rathore, Shubham V. Bakade, Suprit P. Bardekar (2017) [3] In this research paper it is

about to design and build a coaxial, lightweight vehicle, which will consume less space for parking and can be carried along anywhere. In this project, they manufactured electric motor and tested successfully. In addition, they did their analysis by using ansys 15.0 software to measure parameters like impact effect on the vehicle to be manufactured. In addition, structural designed was consider concurrently with component selection, ergonomics to minimize mechanical, electrical and user integration problem. Also, they considered aesthetic parameters in their design. By using of foldable mechanism, it can be used in college campuses and industrial areas to minimize the walking distance and resolve parking problems. As it is electric motor powered, it is easy to operate and due to its compact, lightweight has simple and easily portable.

Deep R Prajapati, Kunjan Shinde, Abhishek Mhaske, Aniket Prabhu (2017) [3] In this presented piece of research paper, due to exponential increment in population and pollution consumption of natural resources of petrol, diesel is necessary to shift our way towards alternate resources like the Electric bike and others because it is necessary to identify new way of transport. E-bike is modified version of pedal cycle by using green energy like electric energy and solar energy. It is energy efficient and cheaper in cost is also affordable to everyone. It is more convenient for travelling shorter distance by people of any age group. Due to it runs on green energy it does not consume fuels like petrol and diesel and also most important feature of this electric bike is, it is produce zero emission, eco-friendly and noiseless in operation. Operating cost per/km is very less and it is using less components thus requiring less maintenance compare to other vehicle.

Naimeesh C H M , Naveen Kumar T, Sandeep B R, Sharath Kumar B N & Batluri Tilak Chandra (2016) [4] In this project, we knew that it is an eco-friendly foldable vehicle with the top speed of 25km/h and its range up to 40km/h. It includes the twist-grip acceleration with a 240W hub motor, and a lithium ion battery. It also includes some features likes LED front light, capillary brakes mounted on both wheel and a digital screen, which shows the battery and speed. It is so compact in size when it folds it becomes the size of the golf bag with the weight of 17kg and using a stand it can be stand easily. Overall, it is a best vehicle, which emits 0% pollution. As it used foldable mechanism, anyone can carry it anywhere and can be used in places like mall, hospital, airport, etc. In addition, it can be placed in a luggage car.

3. PROBLEM FORMULATION

Some vehicles have a problem that we need to solve. Some of the most common problems are like range anxiety, low power to weight ratio, increase in battery capacity, increase in weight, less availability of space for parking and availability of charger and charging facility. Therefore, to solve this type of problem it is simple to use it as an urban mobility, as it is easily foldable it is lightweight and easy to

carry anywhere we want and by using the removable battery we can carry battery anywhere to charge so exact charging point is not required.

4. CONCLUSION

An interesting project in the field of automobile sector a Foldable Electric Vehicle. Using electricity as mode of fuel, it is fully Eco-friendly vehicle. The vehicle consists of Lithium ion battery, hub motor and much more features. Therefore, it is easy to fold and light in weight it so it can be carry and keep anywhere. Moreover, using removable battery it does not necessary to carry whole cycle to the charging point only battery should be carry away. Overall, this is a best vehicle for modern era and in urban mobility.

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