



ASSEMBLY OF ELECTRIC BICYCLE

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ABSTRACT:

A 24V 250W chain drive kit of electric bicycle kit provides a convenient and efficient way to convert a regular bicycle into an electric-powered one. It includes a 24V motor, a chain drive system, and necessary accessories for installation. The 250W power output offers a suitable balance between performance and energy efficiency. Furthermore, the kit's compact design allows for easy installation on various bicycle frames, ensuring versatility and adaptability to different bicycle types. The integrated controller manages power output and assists in maintaining a consistent and controlled riding experience

Keywords: Motor, Battery, controller, bicycle's frame,

Introduction:

Electric bicycles, commonly known as e-bikes, are bicycles equipped with an electric motor that assists with propulsion. E-bicycles have gained popularity in recent years due to their ability to provide a sustainable, affordable, and convenient mode of transportation. They are particularly useful for commuters who want to reduce their carbon footprint, avoid traffic congestion, and save money on transportation costs.

E-bicycles can also be used for short-distance trips within the company premises, reducing the need for cars or other modes of transportation. We believe that e-bicycles are an ideal solution for our transportation needs. Overall, the research on motor and controller systems for electric bicycles is focused on improving the efficiency, performance, and user experience of electric bicycles, with a particular emphasis on reducing weight, increasing range, and improving control systems. They are easy to use, require minimal maintenance, additionally e-bicycles are relatively inexpensive compared to traditional vehicles, making them an affordable option for our employees.

What is the Electric Bicycle: ?

An electric bicycle, commonly known as an e-bike, is a type of bicycle equipped with an electric motor that assists the rider during pedalling or provides propulsion independently. It combines the benefits of traditional cycling with the convenience and efficiency of electric power. E-bikes are gaining popularity worldwide as a sustainable and efficient mode of transportation.

The electric motor on an e-bike is typically powered by a rechargeable battery, which can be easily charged using a standard power outlet. This motor provides varying levels of assistance, allowing riders to choose the amount of pedalling effort they want to exert. Some e-bikes also feature a throttle that enables riders to propel the bike without pedalling.

E-bikes offer several advantages over traditional bicycles. They make uphill climbs and long distances more manageable, reducing the physical strain on riders. They also allow riders to travel at higher speeds with less effort. Additionally, e-bikes are eco-friendly, producing zero emissions during operation and contributing to reduced air pollution.

What is the use of electric bicycles: ?

- **Commuting:** Allowing riders to avoid traffic congestion and reduce their carbon footprint.
- **Fitness and Health:** E-bikes promote physical activity by encouraging riders to pedal and exercise while still providing assistance when needed, making them a suitable option for individuals seeking a balance between fitness and convenience.
- **Extended Range:** Electric bicycles enable riders to cover longer distances with less effort, expanding their commuting or recreational options and reducing fatigue.
- **Accessibility:** E-bikes make cycling accessible to a wider range of individuals, including those who may have physical limitations or struggle with traditional biking due to terrain or distance.
- **Cost Savings:** Electric bicycles can be a cost-effective mode of transportation, as they require less maintenance and eliminate the need for gasoline or public transportation expenses.
- **Fun and Recreation:** E-bikes offer an enjoyable way to explore outdoor spaces, engage in leisure activities, and experience the thrill of cycling with the added assistance of an electric motor.

LITERATURE REVIEW

Ogden Bolton Jr.[1] During the 1890s, electric bicycles were reported inside different U.S. licenses. For instance, on 31 December 1895, was conceded a patent for a battery-controlled bicycles with "6-shaft brush-and-commutator direct current (DC) center point motor mounted in the back tire" (U.S. Patent 552,271). There were no cog wheels and the motor could attract up to 100 amperes from a 10-volt battery.

Gordon John Scott[2] In 1898, imagined an EB that utilized a generator rather than a battery. In his creation, the rider would pedal to turn a generator (dynamo) through a pulley and an adaptable belt, and afterward the power from that generator was utilized to drive a little motor. In any case, this development was considered to have a wasteful plan.

Taiwan[10] imagined an EB that can be collapsed and wheeled manually. Not at all like the earlier EBs with two huge wire-talked wheels, they utilized two little wheels to diminish the necessary extra room. Likewise, they made assistant wheels that arranged over the ground when the bicycles were prepared or rotatable and contact with the ground when the bicycles was collapsed,

Benjamin gauge[11] Numerous auto organizations are likewise keen on the EB field, including Portage, Honda, Peugeot, Mercedes, BMW, Volkswagen, Opel, Hyundai, Lexus, and General Motors Jamerson and that EB deals will ascend to 130 million by 2025 and 800 million by 2100.

OBJECTIVE:

The objective of an electric bicycle is to provide an alternative, environmentally friendly, and efficient mode of transportation.

- **Convenience:** Electric bicycles provide a convenient mode of transportation for short to medium distance commutes. They are particularly useful in urban areas where traffic congestion and limited parking space can make driving a car inconvenient.
- **Eco-friendliness:** Electric bicycles are seen as a more sustainable and eco-friendly option than traditional gas-powered vehicles, as they produce fewer emissions and have a smaller carbon footprint.
- **Efficiency:** Electric bicycles can help riders travel longer distances with less effort than a traditional bicycle, making them a practical alternative to cars and public transportation for commuting and running errands.
- **Physical activity:** While electric bicycles provide an electric assist, they still require pedalling, which can provide a moderate level of physical activity and help improve cardiovascular health.
- **Cost-effectiveness:** Electric bicycles can be a cost-effective alternative to cars, as they require less maintenance and fuel costs, and may be eligible for tax incentives or other subsidies.
- **Accessibility:** Electric bicycles can make cycling more accessible to people who may not have the physical ability or stamina to ride a traditional bicycle, such as older adults or individuals with disabilities.

Overall, the objective of electric bicycles is to provide a practical, sustainable, and accessible transportation option that can help reduce traffic congestion, improve air quality, and promote physical activity.

METHODOLOGY:

The methodology of an electric bicycle project typically involves the following steps:

- **Research and Planning:** The first step is to conduct research on electric bicycles, including their design, construction, and functionality. This research will inform the planning phase, where the project goals and objectives are defined, along with the project scope, timeline, and budget.
- **Design and Development:** The next step is to design and develop the electric bicycle, which involves selecting the appropriate components, such as the motor, battery, and controller, and integrating them into the bicycle frame.
- **Prototyping and Testing:** Once the design is complete, a prototype of the electric bicycle is built and tested. This involves testing the motor, battery, and controller, as well as the overall functionality and safety of the bicycle. The prototype can be refined through iterative testing and feedback.
- **Data Collection and Analysis:** During the testing phase, data is collected on the performance of the electric bicycle, including its speed, range, and power consumption. This data is then analysed to identify any areas for improvement or optimization.
- **Optimization and Refinement:** Based on the data analysis, the electric bicycle design is optimized and refined to improve its performance, efficiency, and safety. This may involve making changes to the motor, battery, or controller, as well as adjustments to the bicycle frame or components.
- **Final Testing and Validation:** Once the design has been optimized and refined, this includes testing for safety, reliability, and overall performance.
- **Documentation and Reporting:** Finally, the project is documented and reported, including a detailed description of the electric bicycle design and development process, along with any data analysis and testing results. The report may also include recommendations for further research and development.

ASSEMBLY

Materials:

- 24v 250w chain drive electric bicycle kit (includes motor, battery, controller, throttle, and other components)
- Bicycle frame
- Wrenches (adjustable or spanner), Screwdriver (Phillips or flathead), Zip ties
- Battery, charger
- Multi-meter

Step 1: Install the motor

- Remove the pedals and crank set from the bicycle frame.
- Attach the motor bracket to the bottom bracket of the frame using the provided bolts and nuts.
- Slide the motor onto the bracket and secure it with the provided bolts and washers.
- Reinstall the crank set and pedals onto the motor.

Step 2: Mount the battery

- Determine the best location for the battery on the frame (usually near the seat post or on the downtube).
- Attach the battery holder to the frame using the provided bolts and nuts.
- Place the battery onto the holder and secure it with the provided straps or screws.

Step 3: Connect the components

- Locate the controller and throttle on the kit.
- Connect the wires from the motor to the controller using the provided connectors.
- Connect the throttle to the controller using the provided connectors.
- Connect the battery to the controller using the provided connectors.

Step 4: Test the system

- Turn on the power switch on the controller and test the system by twisting the throttle.
- Ensure that the motor spins and the bicycle move forward.
- Adjust the brakes and gears as necessary to ensure they work with the new system.

Step 5: Secure the wiring

- Use zip ties to secure the wires and cables to the frame to prevent them from getting caught in the moving parts of the bike.
- Use electric tape to cover any exposed wires or connections to prevent water damage.



Figure 1 Installing throttle & electric brakes



Figure 2 Installing chain to wheel sprocket



Figure 3 Installing motor to bicycle frame

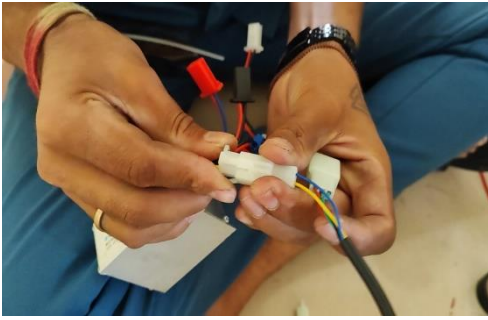


Figure 5 Connecting controller wires

Figure 4 installing battery to bicycle frame



Figure 6 securing the wiring



Figure 7 Installing the ignition key



Figure 8 Installing light & horn



Figure 9 Assembly of electric bicycle

Conclusion

In conclusion, the electric bicycle 24V 250W chain drive kit project demonstrates the potential of electric bicycles as an alternative mode of transportation. The project findings suggest that the use of electric bicycles can offer an easier and more efficient riding experience, especially when navigating challenging terrain or long distances.

Despite the limitations, the affordability and ease of installation of the electric bicycle 24V 250W chain drive kit make it an accessible option for those who may not be able to afford a traditional electric bicycle. Overall, the electric bicycle 24V 250W chain drive kit project demonstrates the potential for

electric bicycles to promote sustainable transportation and provides a foundation for future research and development in this area.

Implications:

- The electric bicycle conversion kit can encourage more people to choose cycling as a mode of transportation, as it provides an easier and more efficient riding experience.
- The use of electric bicycles can reduce carbon emissions and contribute to a more sustainable future.
- The affordability and ease of installation of the electric bicycle conversion kit can make electric bicycles more accessible to a wider range of people, including those who may not be able to afford a traditional electric Bicycle

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