

# Fabrication of Electric Powered Two Wheeler

Dr. T. Jayananda Kumar<sup>1</sup> | M Sai Subrahmanyam<sup>2</sup> | G Omkar<sup>3</sup> | S Sathish Kumar<sup>4</sup> | P Balaji<sup>5</sup>

<sup>1</sup>Department of Mechanical Engineering, Godavari Institute of Engineering and Technology (A), Rajahmundry.

**Abstract:** In present situation a Electrical Bicycle system will help to reduce the problems of fuel and pollution. The emission of carbon-dioxide from an automobile exhaust is a concern for the increasing rate of global warming. The fuel prices in India and around the world is increasing day by day thus there is a tremendous need to search for an alternative to conserve these natural resources. Promoting use of Electrical Bicycles can reduce CO<sub>2</sub>emission and the fuel costs. TheElectrical bicycle which provides alternative by utilising Electrical energy to charge the battery and thus provide required voltage to run the motor. India is blessed with nine months of sunny climate thus concept of Electric bicycle will be very useful in India.

**KEYWORDS:**Bicycle, Electric Power, Pollution



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## INTRODUCTION:

An electric bicycle, also known as an e-bike is a bicycle with an integrated electric motor used to assist propulsion. Many kinds of e-bikes are available worldwide, but they generally fall into two broad categories: bikes that assist the rider's pedal-power and bikes that add a throttle, integrating moped-style functionality.

This project has various benefits both to the members of the team and also external benefits thereby making awareness of using alternative modes of transport. The Electric Bike which works on the battery that is powered by the motor is the general mode of transport for a local trip. The solar panels can be alternative source for this by adding it to the system. The Electric bike which will be running on battery, the power is supplied by the motor, thereby supplying this power to drive the other gear components. The main purpose of using this E-bike is that it is user friendly, economical and relatively cheap. The efficiency of this system undeniable compared to conventional modes of transport.

## STRUCTURE OF PAPER

The paper is organized as follows: In Section 1, we Provided Abstract. In Section 2 the introduction along with structure of paper. In Section 3 objectives and related work. In section 4 Process Description. In section 5 Construction & working. In section 6 Future scope and conclusion and References.

## OBJECTIVES

- The Main objective of this project is to create Eco Friendly Vehicle.
- Saving lots of money. If we use petrol or diesel vehicle pollution will increase and also we have to spend lots of money. Today Fuel rates are so high.
- Another main objective is to save time. If you want to go some short distance place this E bike will save your time.
- Another Main Objective is to Reduce the global warming and Pollution. If we use E bikes, we can save nature and the Pollution comes from E bike is zero.
- Another main objective is to create Physical and Health benefits.

## RELATED WORK

There are numerous works that have been done related to Solar Bicycle, Electric Powered Two wheeler, E- bike, Electric Vehicle.

JENNIFER DILL, GEOFFERY ROSE (2012) clarified that Electric bicycles are progressively regular in China however are moderately uncommon in the United States. Proprietors of e-bicycles noticed their capacity to travel longer separations and over slopes without any difficulty and to touch base at a goal. The vast majority of the talked with E bicycle proprietors utilized their E-bicycles to substitute for movement by either human-fueled bikes or customary engine vehicles. Thus, the E-bicycle can address worries about medical issues identified with inertia, contamination, and other open strategy issues to which private vehicles contribute. Further research is expected to decide if explicit approaches are expected to expand reception of e-bicycles. The potential for strife between riders of e-bicycles and of standard bicycles due to speed differentials is a worry. Regardless of whether speed differentials will represent a noteworthy issue will depend not just on the degree of selection of E bikes however the qualities of the riders.

D. C.C.CHAN (2002) talked about a reality where condition assurance and vitality preservation are developing concerns, the advancement of electric vehicles (EV) and half and half electric vehicles (HEV) has taken on a quickened pace. The fantasy of having industrially practical EVs and HEVs is turning into a reality. EVs and HEVs are step by step accessible in the market. The significance of the combination of innovations of vehicle, electric engine drive, hardware, vitality stockpiling, and controls and furthermore the significance of the reconciliation of society quality from government, industry, explore establishments, electric power utilities, and transportation experts are tended to. The test of EV commercialization is examined.

Gorenflo et al. (2017), Kiefer and Behrendt (2016), Fyhri and Fearnley (2015), Fluchter and Wortmann (2014), as well as Paefgen and Michahelles (2010), focused, for instance, on usage patterns. Gorenflo et al. (2017) conducted a 3-year field trial with 33 sensor-equipped e-bikes. The E Bike field trial analyzed the usage of the e-bike and the charging

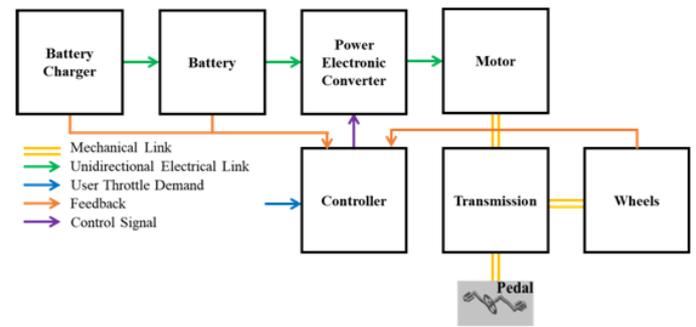
status of its battery. Results show that e-bikes are mainly used for commuting. Regarding users' charging habits, results showed that participants usually charge their e-bike's batteries just after they return home. It was also noticed that some participants chose to charge their e-bike's batteries later in the evening, just before they go to bed.

HENRY MUNSUN, a citizen of the United state, residing at Forsyth , in the country of rosebud and Montana ,have invented new and useful improvement in tater bicycle.This invention relates to bicycles and the object of the invention is to provide a device of this character which can travel on both land with these and other objects in view which will appear as the description processes , the invention resides in the novel construction and arrangement of parts hereinafter fully described and claimed.

**The German Naturalistic Cycling Study - Comparing cycling speed of riders of different E bikes and Conventional bikes.**

Objective of this paper to was to explore the acceleration and speed of orthodox and electrically powered bicycles under truthful statuses. Authors distinguished between electric bicycles which deliver provision up to 45 km/h (as known as S-pedelegs) and 25 km/h (speed of pedelegs). Additionally, as speed limits of 30 km/h might influence especially on the execution of speedier cyclists (e.g. Spedelec rider), the potential mean speed might be even advanced under various situations. Authors also found noteworthy variances in numerous measures between pedelegs and orthodox bicycles, although less noticeable. This might interpreted as a symptom that, when accelerating from standstill, the assistance provided from motor used by the pedeleg riders to reach their preferred speed easier, not earlier. Authors also given the variance in the user population, it is not irrational to admit that at present, e-bikes do not cause any revolution in cycling mean speed at all. The growth of e-bikes in younger cyclists is still there. It has even been embraced that the e-bicycle is going from being a "recovery vehicle" to a stylish frill. By this authors gave the vision that this will change two wheeled activity and street security in the center and long stretch.

**PROCESS DESCRIPTION**



**The Four Main Components:**

- 1. MOTOR
- 2. BATTERY.
- 3. MOTOR CONTROLLER



24V 250W.  
24V 250W

24V 30ah.

**4. THROTTLE**



**BATTERY:**

This project revolves around supplying and utilizing energy within a high voltage battery. It demands for a battery with longer running hours, lighter weight with respect to its high output voltage and higher energy density. Among all the existing rechargeable battery systems, the lithium ion cell technology is the most efficient and practical choice for the desired application. Aluminum casing is provided to house the internal components of the battery. The battery is rated is at 24V, 15AH. The amount of charging cycles of the battery is greater than 800. Lithium ion batteries are one of the most popular types of battery for portable electronics. Although slightly

lower in energy density than lithium metal, lithium-ion is safe, provided certain precautions are met when charging and discharging. With its many advantages over other conventional types of batteries, the lithium ion battery was the optimum choice for an electric powered bicycle.

#### **FREEWHEEL:**

In mechanical or automotive engineering, a free wheel is a device in a transmission that disengages the driveshaft from the driven shaft when the driven shaft rotates faster than the driveshaft. An overdrive is sometimes mistakenly called a freewheel, but is otherwise unrelated.

The condition of a driven shaft spinning faster than its driveshaft exists in most bicycles when the rider stops pedaling. In a fixed-gear bicycle, without a freewheel, the rear wheel drives the pedals around.



#### **THROTTLE:**

The throttle mode is similar to how a motorcycle or scooter operates. When the throttle is engaged the motor provides power and propels you and the bike forward.

A throttle allows you to pedal or just kick back and enjoy a "free" ride! Most throttles can be fine tuned like a volume dial between low and full power.

The motor power can be increased or decreased by the restriction of current (by use of a throttle). The term throttle has come to refer, informally, to any mechanism by which the power or speed of an engine or motor is regulated. A few e-bikes have a throttle, which may conjure visions of a motorcycle's twist grip, but in reality is usually just a small electric button. Throttle has speed control steps like 12345.

That will help to reduce or Increase the speed.

#### **CONTROLLER:**

The mechanism of an electric speed controller varies depending on whether you own an adaptive or purpose build electric bike. An adaptive bike includes an electric drive system installed on an ordinary bicycle. A

purpose built bike, more expensive than an adaptive bike, provides easier acceleration and affords more features. The electric bike speed controller sends signals to the bike's motor hub in various voltages. These signals detect the direction of a rotor relative to the starter coil. The proper function of a speed control depends on the employment of various mechanisms. In a purpose-built electric bike, Hall effect sensors help detect the orientation of the rotor. If your speed controller does not include such sensors -- and the speed controller on an adaptive bike may not the electromotive force of the undriven coil is calculated to get the rotor orientation. The analog control systems on this bike are a result of the need for user operation of the motor control elements. A half-twist throttle has been selected as the method for user interface to these elements.

#### **MOTOR:**

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor. DC motors were the first form of motor widely used, as they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances. Larger DC motors are currently used in propulsion of electric vehicles, elevator and hoists, and in drives for steel rolling mills.

Specification	
Rated output Power	250W
Rated Voltage	24V DC
Rated speed	3000RPM
No load speed	3850RPM
Full load Current	≤13.4A
No load Current	≤2.2A
Rated Torque	0.80N.m
Efficiency	≥78%
Gear Ratio	
Application	

## CHAIN DRIVE:

Chain drive is a way of transmitting mechanical power from one place to another. It is often used to convey power to the wheels of a vehicle, particularly bicycles and motorcycles. It is also used in a wide variety of machines besides vehicles. A chain-drive system uses one or more roller chains to transmit power from a differential to the rear axle. This system allowed for a great deal of vertical axle movement (for example, over bumps), and was simpler to design and build than a rigid driveshaft in a workable suspension. Also, it had less unsprung weight at the rear wheels than the Hotchkiss drive, which would have had half the weight of the driveshaft, and differential to carry as well.



## CONSTRUCTION & WORKING:

The Four Main Components We're using for E-bike is Motor, Controller, Throttle, Battery. We'll use other components also like free wheel, chain, Motor mounting bracket, chain Etc

The E bike works on the Electric Power. For Electrical power we use Battery. For Charge The battery we can use solar power or in other ways also.

For this Project we're using 24v 250W motor and 12v+12v battery or 24v battery and 24v 250w motor controller. The motor controller controls the charge and speed of the vehicle and other Operations. As we shown the block Diagram we'll fix the motor to the rear part of the Bicycle. For transmission we'll use free wheel and chain. With the help of free wheel and chain motor will rotate the rear wheel.

Then we have to connect motor controller to the battery, motor and throttle.

Then fix the throttle to Bicycle Handle. Throttle helps to reduce or Increase the Speed. With One charge the E Bike can travel from 25Km to 45Km. Thats because it depends on battery and motor.

If we clean Parts and components everyday we can get high efficiency.

## Advantages

- Non poluting
- Zero Emission
- It requires non exhaustible fuel resource
- Easy to use
- Smooth and silent.
- Less maintenance cost compared to pollutant vehicles.
- No license required if the requirements met.

## FUTURE SCOPE AND CONCLUSION

With the growing emphasis on environment-friendly technologies in the automobile industry, it's no surprise that two-wheelers are also heading towards this direction. Presently in India, electric two-wheelers are not much appreciated due to their limited speed, range and not so good performance. The electric motor has been available for ages, but it was quite difficult to squeeze the electric motor and its battery in the motorcycle. With time, the battery technology has been improving and now electric bikes seem to be a reality. The main conclusion from this study was that e-bikes are faster than regular bikes and therefore new safety issues may arise when e-bikes interact with other vehicles on the road.

## REFERENCES

1. <https://en.m.wikipedia.org>
2. <https://www.researchgate.net>
3. "It's not a bike, it's a bike-shaped Uber that says "JUMP"" Retrieved 2017-11-10.
4. J. David Goodman (2010-01-31). "An Electric Boost for Bicyclists". The New York Times. Retrieved 2010-05-31.
5. neighborhood EVs," Electric Battery Bicycle Co, Naples, FL, 2002.
6. B. Kumar and H. Oman, "Power control for battery-electric bicycles," in Proc. NAECON '93—National Aerospace and Electronics Conf., vol. 1, May 24–28, 1993, pp. 428–434.
7. GOODMAN, J. D. (2010, Jan 31). An Electric Boost for Bicyclists. The New York Times.
8. Barve, D. S. (March 2016). Design and Development of Solar Hybrid Bicycle. International Journal of Current Engineering and Technology.