

# Hybrid Cycle with the Combination of Flywheel and Gear System

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I am used three gears which is connected with the flywheel, and the flywheel transfer kinetic energy through the gears system which is makes the double boosting power of cycle.

All these steps will help to the all runner for using less energy and run fast.

## 2. MATERIAL & METHOD

**Flywheel-** I was used flywheel made of aluminum because flywheel mean determined by the maximum quantity of energy it can e stored per unit weight.

Diameter of flywheel -220mm (9.0")

Weight of flywheel-4.5 about

Rpm of flywheel-64,5000rpm

**Gears-** Gear are used made by steel alloy. 3 gears are used in this system.

**Cvt-** C. v. t blocks are used at about 100 degree Celsius high pressure and friction condition so I used nylon 9T, PA9T

## 3. WHY MECHANICAL HYBRID CYCLE ?

➤ By recovering and re-using energy, HYBRID CYCLE reduces fuel consumption thereby saves money and lowers CO<sub>2</sub> and other pollutants emission.

## ABSTRACT

The mean of my hybrid cycle is that the flywheel connected with the back wheel with the help of chain mechanism and also the gear system connected with it. The main function of flywheel is to store the waste energy which arises due to break. Like heat energy, sound energy.

And the stored energy utilized by the help of gears as we required speed during riding.

**Keywords:** clutch, flywheel, chain

## 1. INTRODUCTION

Does not matter how much technology developed in our India and it increasing day by day, new research, new ideas, developed in early life...But still most of areas uses bicycle. And they use man power to run the bicycle. There's also a lot of children and old man.

I used a hybrid system which is recover the kinetic energy which is arise by applying brakes.

Flywheel use as an energy stored devise.

The energy is arising due to applying break. This energy stored in flywheel which is connected with the back wheel and also with the gears system by the help chain mechanism.

- Significantly lighter and smaller packaging than battery electric hybridization systems, reducing the impact on Gross Vehicle Weight and overall capacity.
- No infrastructure investment required for charging or safety equipment.
- Reduces wear and tear on vehicle brakes and retarders by providing up to 70% of the required braking capacity.
- Long system life & low maintenance requirement
- Effective across a range of drive cycles, returning best economy improvements in urban driving.
- HYBRID CYCLE can be used to "torque-fill" during phases when the engine is producing low torque output. This can be useful to overcome turbo lag in turbo-charged vehicles.[3]
- Have the highest efficiency among other recovery systems i.e. 70% in mechanical HYBRID CYCLE as compared to 25% in TERS (thermal energy recovering system) & 30% in the electric hybrid system

## 4. CONCLUSION

If I think about the previous research they all are using only flywheel and cvt with clutch but i used gears system it help for boosting as the dual power and as our wish to change the gears according to speed.

I think this is the best idea for reducing the man power for running the bicycle because it give us dual boosting power which help in reducing man power within very less effort.

In this project a flywheel and gears based KERS system was designed. The product designed in this project is a hybrid of clutch; flywheel and gears based KERS systems. This system is expected to be cheaper than CVT based KERS system. Effective and efficient manufacturing procedures for the components of the KERS were also found out. Using FEA analysis the components are tested and modified to avoid failure. This project can guide anyone to fabricate his own KERS system for his bicycle very easily. It was found that all the components were safe under the extreme operating condition. Different types of KERS systems and their uses were also studied. It was found that flywheel can be used instead of battery to store and deliver energy efficiently. As use of flywheel in bicycle is a new concept, this field has a huge scope and wide range of implementation ahead.

### FUTURE SCOPE

This project has a huge future scope. The design in this project can be fabricated. Because many car companies are

looking into using the system in average everyday cars. Volvo in partnership with Flybrid, officially announced that they intend to develop and produce a vehicle that uses the flywheel based kinetic energy recovery system. The latest advancements in the field, the potential future and scope of the flywheel hybrid will be assessed.

The HYBRID CYCLE system can be automated using PID controllers. Instead of using lever arm servo motors can be used. The design of the flywheel can be optimized. Instead of chain drive efficient belt drive CVT can be used to improve the power transmission. This allow the use of even broader range of sprocket ratios and will increase the efficiency. Research work can be done to shift the flywheel to the rear wheel center that will save lot of space and reduce the amount of complexity. Design of the left handle with required mechanical advantage and aesthetics can be done. Design of the HYBRID CYCLE housing can be dome. As all the manufacturing procedures for the HYBRID CYCLE components are described elaborately in this project can be used to develop a production line for large scale production this product can be brought to the market..



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