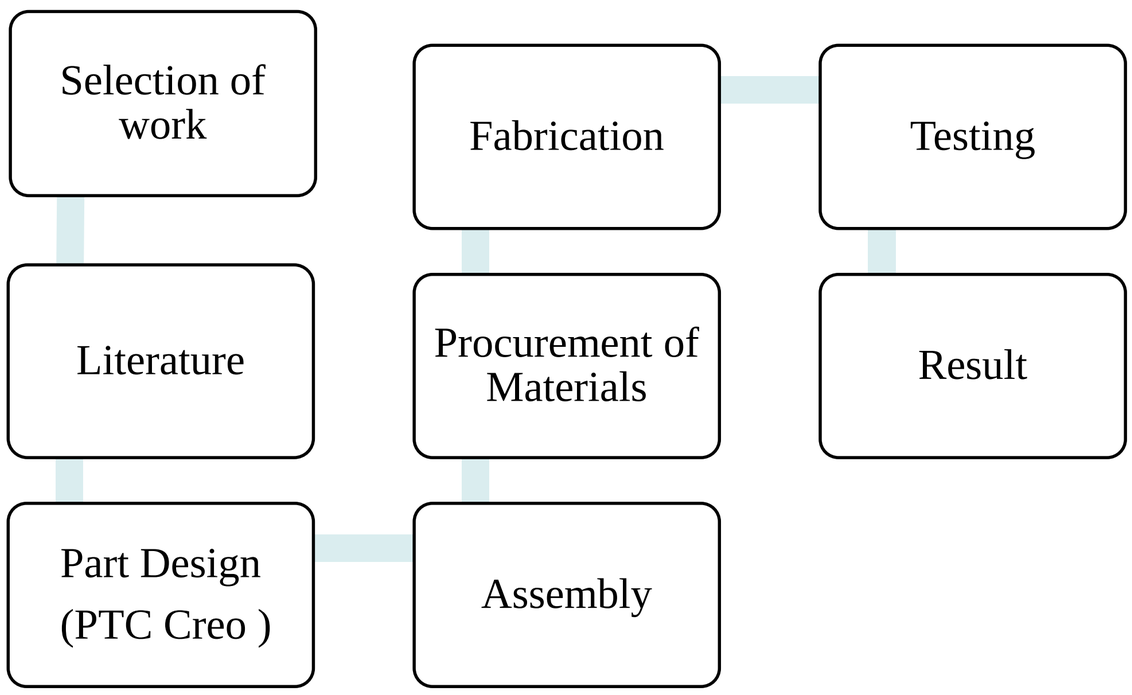
Design and Fabrication of Regenerative Braking System.

INTRODUCTION

In recent years, there is the lack of reliable alternative energy sources, increasing efficiency and reducing exhaust gas emissions has become the focus of the modern automotive research. Commercial vehicles such as refuse trucks and delivery vehicles lose a tremendous amount of kinetic energy during frequent braking and constant drive at low speeds on designated city routes, which results in higher fuel consumption and GHG (Green House Emission Gas) emission than other on-road vehicles. Numerous attempts are made to enhance sort of vehicles. The technological combination of EGR (Exhaust Gas Recirculation) and DPF (Diesel Particulate Filter) after treatment is one of the effective ways to solve the vehicle emission, especially for NOx and soot.

However, this method is not able to reduce the GHG emission since the low temperature combustion of this technology results in increasing the fuel penalty. Sacrificing engine efficiency in exchange for reduced pollutants can't essentially resolve the energy crisis. In order to realize overall GHG reduction targets, a robust reduction is required particularly for commercial vehicles. Regenerative energy technology is one among the key features of electrified vehicles. It allows the vehicle to capture a tremendous amount of the kinetic energy lost during braking or decelerating for reuse. Researcher believes, energy recovery technology can significantly fetch down the energy consumption of electrified vehicle, mostly in urban operated route. Generally, there are two regenerative energy approaches which have been applied to commercial vehicles: Regenerative Braking System and Boost Recovery System. Both technologies allow commercial vehicles to possess a big improvement of reducing fuel consumption also as emissions. The more energy the regenerative braking recovers - the fewer fuel is consumed.

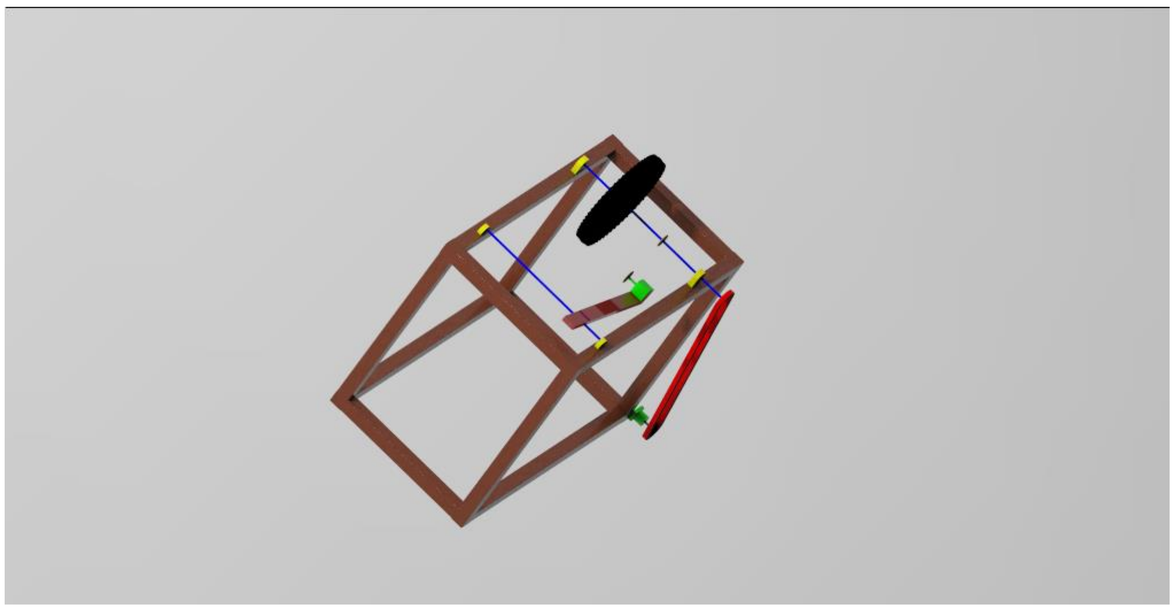
OBJECTIVES & METHODS



RESULTS

S.N	RPM before brake pedal pressed	RPM after brake pedal pressed	Voltage output
1	150	141	9.34
2	175	159	11.88
3	200	178	12.81
4	225	196	13.91
5	250	224	14.49
6	300	281	14.49
7	400	382	14.49

As shown in the above table, we can generated up to 14.49 V in 400 rpm.



NOVELTY / COMMERCIAL POTENTIAL

1. Firstly, we haven't used any clutch system as this is the test rig model which will be implemented in the Electric-bikes and scooters.
2. Previous researcher had used stepper and servo motor as a regenerative motor to generate the power where as we have used Brushed D.C motor with gear. This brushed D.C motor with gear is producing more power than these two types of motor as compared from past report.

REFERENCES

[1]Sayed Nashit, Sufiyan Adhikari, Shaikh Farhan, Srivastava Avinash and Amruta Gambhire, 'Design, Fabrication and Testing of Regenerative Braking Test Rig for BLDC Motor', 2016.

[2]Tushar L. Patil, Rohit S. Yadav, Abhishek D. Mandhare, Mahesh Saggam, Ankul Pratap,'Performance Improvement of Regenerative braking system', 2018.

[3]C. Jagadeesh Vikram, D. Mohan Kumar, Dr. P. Naveen Chandra, 'Fabrication of Regenerative Braking System', 2018.

[4]Siddharth K Sheladia, Karan K Patel, Vraj D Savalia, Rutvik G Savaliya, 'A Review on Regenerative Braking Methodology in Electric Vehicle', 2018.

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