Malla Reddy College of Engineering and Technology

UGC Autonomous, NBA Accredited, Approved by AICTE, Affiliated to JNTUH

Department of Mechanical Engineering

Design and Fabrication of Regenerative Braking System

Name of the student(s)	Hall Ticket Number(s)
Milan Lamichhane	(16N31A03G8)
Surendra Yonjan	(16N31A03H0)
Navin Bhetal	(16N31A03H4)

Bachelor of Technology
2016-2020

Design and Fabrication of Regenerative Braking System

A Major Project report submitted in partial fulfillment of the

requirements for the degree

of

Bachelor of Technology

in

Mechanical Engineering

by

Milan Lamichhane	(16N31A03G8)
Surendra Yonjan	(16N31A03H0)
Navin Bhetal	(16N31A03H4)

Under the guidance of
Mr. Oy Venkata Subba Reddy
Assistant Professor

Department of Mechanical Engineering

Malla Reddy College of Engineering and Technology

UGC Autonomous, NBA Accredited, Approved by AICTE, Affiliated to JNTUH

Secunderabad – 500100, Telangana, India.

2016-2020

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

Autonomous Institution - UGC Govt. of India
(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade)
Secunderabad – 500100, Telangana State, India

Department of Mechanical Engineering

CERTIFICATE

This is to certify that the Major Project work entitled "**Design and Fabrication of Regenerative Braking System**" is carried out by **Milan Lamichhane (16N31A03G8), Surendra Yonjan (16N31A03H0), Navin Bhetal (16N31A03H4)** in partial fulfillment for the award of degree of **Bachelor of Technology** in **Mechanical Engineering**, Jawaharlal Nehru Technological University, Hyderabad during the academic year 2019-2020.

Mr. Oy Venkata Subba Reddy	Prof. Dr A. N. R. Reddy
Internal Guide	HOD

External Examiner

DECLARATION

We hereby declare that the project titled "Design and Fabrication of Regenerative Braking System" submitted to Malla Reddy College of Engineering and Technology (UGC-Autonomous), affiliated to Jawaharlal Nehru Technological University Hyderabad (JNTUH) for the award of the degree of Bachelor of Technology in Mechanical Engineering is a result of original research carried-out in this thesis. We understand that our report may be made electronically available to the public. It is further declared that the project report or any part thereof has not been previously submitted to any University or Institute for the award of degree or diploma.

Name of Student(s) : Milan Lamichhane, Surendra Yonjan & Navin Bhetal.

Hall Ticket Number(s) : 16N31A03G8, 16N31A03H0 &16N31A03H4.

Degree : Bachelor of Technology in Mechanical Engineering

Department : Mechanical Engineering

Title of the project : Design and Fabrication of Regenerative Braking System

(Milan Lamichhane)	(Surendra Yonjan)	(Navin Bhetal)

Date:

ACKNOWLEDGEMENT

We feel honored and privileged to place our warm salutation to our college Malla Reddy College of Engineering and Technology (UGC-Autonomous) and our principal **Dr. VSK Reddy** who gave us the opportunity to have experience in engineering and profound technical knowledge.

We offer our sincere gratitude to our Dean, Academics **Dr. M. Murali Krishna** who is the backbone in organizing the projects and encouraged us throughout the academic journey.

We express our heartiest thanks to our Head of the Department **Dr. A. N. R. Reddy** for encouraging us in every aspect of our project and helping us realize our full potential.

We would like to thank our internal guide and Project Coordinator **Mr. Oy Venkata Subba Reddy** for his regular guidance and constant encouragement.

We would like to thank our class in charge **Mr. Konda Saidulu** who in spite of being busy with his duties took time to guide and keep us on the correct path.

We would also like to thank all the supporting staff of the Department of Mechanical Engineering and all other departments who have been helpful directly or indirectly in making our project a success.

We are extremely grateful to our parents for their blessings and prayers for the completion of our project that gave us strength to do our project.

With regards and gratitude

Milan Lamichhane : 16N31A03G8

Surendra Yonjan : 16N31A03H0

Navin Bhetal : 16N31A03H4

Abstract

As in today's world, where there are energy crises and therefore the resources are depleting at a better rate, there's a requirement of specific technology that recovers the energy, which gets usually wasted. So, just in case of automobiles one among these useful technology is that the regenerative braking system. Regenerative braking is an energy recovery mechanism that slows a vehicle or object by converting its Kinetic Energy (K.E) into a form which will be either used immediately or stored until needed. Using regenerative braking system in automobiles enables us to recover the K.E. of the vehicle to some extent that's lost during the braking process.

The converted K.E. is stored for future use or is fed back to the facility system of the vehicle. This energy is often stored during a battery or bank of capacitors for later use. Energy also can be stored with the assistance of a rotating flywheel which is one among the foremost inexpensive and effective method of storing and regenerating power. The present invention provides energy-storing regenerative braking system by transmitting the flywheel force as a torque tending to oppose the forward rotation of a wheel on applying the brakes.

A brake-pad assembly, mounted concentrically with the hub of a ground-engaging wheel, is actuated upon braking to supply frictional engagement between the hub and clutch mechanism, while applying a decelerating torque to the wheel. The special braking mechanism is selectively held in position by a rider-controlled clutch mechanism, to accumulate energy over several braking events. Vehicles driven by electric motors use the motor as a generator when using regenerative braking and its output is supplied to an electrical load. The transfer of energy to the load provides the braking effect and regenerates power.

Keywords: Regenerative Braking, Generator, Brake pad, Energy Recovery, Flywheel.

TABLE OF CONTENTS

LIST OF TABLES

List of Figures Page no.