K.S.R. COLLEGE OF ENGINEERING

(APPROVED BY AICTE & AFFILIATED TO ANNA UNIVERSITY)

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DEPARTMENT OF AUTOMOBILE ENGINEERING

AUTOEVON'25

MAGAZINE

JULY 2024 - DECEMBER 2024

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

(Approved by AICTE, Affiliated to Anna University, Accredited by NAAC A++ Grade)

K.S.R. Kalvi Nagar, Tiruchengode-637215, Namakkal District, Tamil Nadu.

DEPARTMENT OF AUTOMOBILE ENGINEERING

AUTOEVON'25

TECHNICAL MAGAZINE

(Volume 16 / Issue 01 / December 2024)

ACADEMIC YEAR 2024-2025

K. S. R. COLLEGE OF ENGINEERING

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With the Blessings of our Beloved Founder

Forever in our hearts,

Forever in our thoughts!

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Chairman's Message

Vision looks in ward and become duty.

Vision looks outward and become aspiration.

Vision looks upward and become faith.

Shri R. Srinivasan BBM., MISTE.,
Chairman, KSR Educational Institutions.

Education is the foundation of a brighter tomorrow, and this magazine reflects the vibrant spirit of our learners. May it continue to inspire creativity, excellence, and lifelong curiosity in every reader. In the recent times, the role of KSRCE is to carry out proactive research and development activities to make the students as well as faculty member's intellectuals, which are very challenging and demanding. It is of great significance that this magazine is going to deliberate upon It will definitely explore new areas of practice and enhancing quality of professional services. I am sure this magazine will be a milestone in ensuring the highest standards in this profession. I wish the organizers the very best in this and all their other endeavors. I am eagerly looking forward to seeing you and enjoying this magazine.

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Principal's Message

Dr. M. Venkatesan
Principal – KSRCE

As a Principal of KSRCE, I actively play my role to facilitate students to become best academicians, researchers and policy makers. I provide a diverse and inclusive work environment to my colleagues and drive them wherever necessary to play a role in getting utmost national and international agencies support Institution. A collaborative and integrated approach towards teaching, learning and research will be emphasized. I strongly believe that the KSRCE team will overcome the constraints facing to deliver the best Engineering services to the society and reach the desired goals.

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HOD'S Message

Prof. Dr. R.VENKATACHALAM.,
Head of the Department - AE

It is a pleasure to present this edition of our Automobile Engineering magazine. Our department continues to push the boundaries of innovation, merging engineering principles with Automotive to develop impactful Automotive Sector. Our students and faculty are driving meaningful change. This magazine highlights their inspiring work, research, and achievements. We take pride in nurturing a culture of curiosity, collaboration, and excellence. As we move forward, we remain committed to shaping the future of Automotives through technology, creativity, and dedication. On behalf of the editorial board, proudly presenting ***AUTOEVON'25*** designed with a vision to quench the thirst by layering a platform for innovative ideas. The soul of creativity lies in the dream to unveil inherent talent. The power of this dream fueled us forward and made ***AUTOEVON'25*** a reality. We are thankful to all who contributed to fulfil our dream. First and foremost, let me thank our chairman who was always with us, to provide a wonderful platform to nourish the talents. I extend my sincere thanks to Principal who were always in the forefront to encourage and inspire to execute wonderful ideas. I thank all students and faculty coordinators for their overwhelming support to bring out ***AUTOEVON'25***.

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AUTOEVON'25

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VISION OF THE DEPARTMENT

Education and research to meet the need of global automotive industry and society.

MISSION OF THE DEPARTMENT

DM 1: Quality education through flexible curriculum, research and self-learning.

DM2: Training via automotive industry for a sustainable society and social development.

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DEPARTMENT PROFILE

The Department of Automobile Engineering (AE) was started in the year 2009 with an intake of 60 students. Over the years the Department has steadily grown and currently the student's intake is 60. Along with B.E., the Department also offers Ph.D., degree Programme. The Department of Automobile Engineering and its stakeholders work together to create a stimulating, diverse and positive learning environment to gain knowledge. We strive to provide the highest quality of education to our students, so they can become true leaders and outstanding citizens. We constantly endeavor for research activities that will contribute to the well-being of people, the economy and the environment all over the world. As a community of individuals who value true excellence and preeminence, we seek to compete and empower one another to reach our full potential while caring for others and our environment.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1:

Core expertise: Apply technical knowledge and competitive in automobile engineering field**.**

PEO 2:

Sustainable Solutions: Impart inter-disciplinary skills and innovations for challenges that emerge in automobile sector.

PEO 3:

Ethical Proficiency: Enhance knowledge with professional ethics, attitude, communication and leadership skills.

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PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide
valid conclusions.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the
limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community
and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

PO12: Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1:

Professional competency: Design and analyze automotive components, electrical and electronic systems.

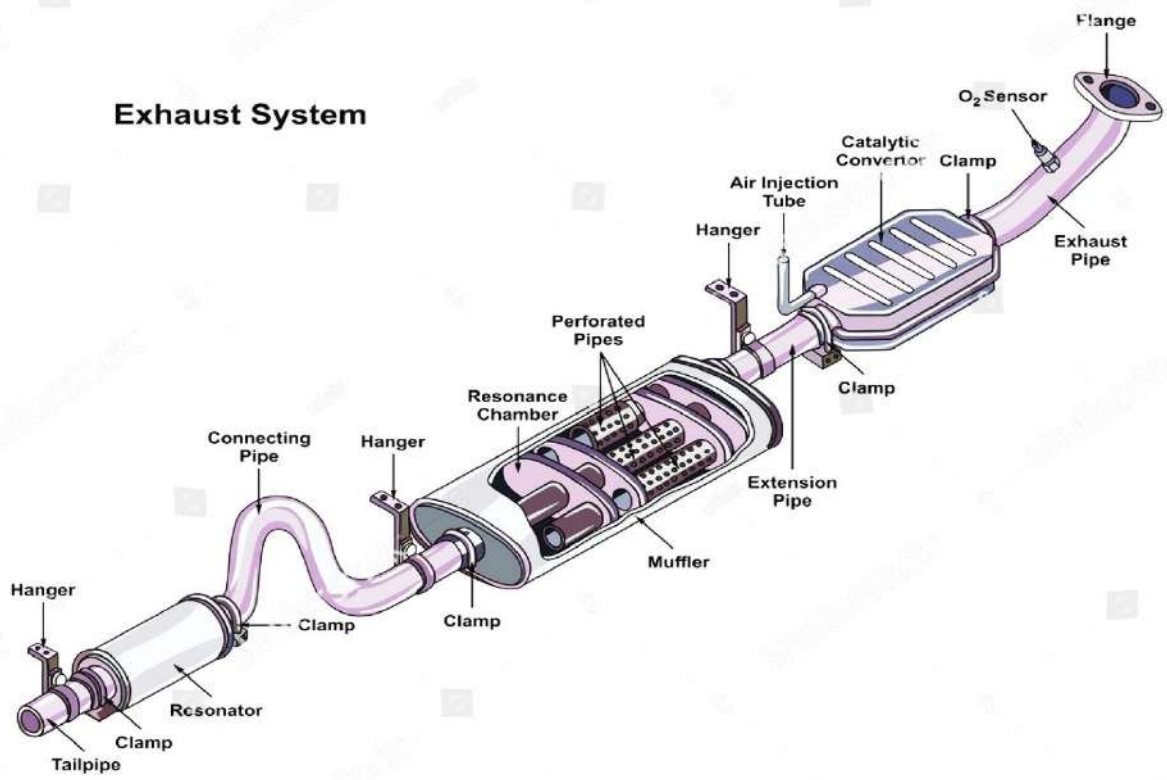
PSO 2:

Troubleshoot Skills: Develop as a professional in maintenance and service of automotive systems

OUR CARS ARE TURNING INTO SMARTPHONES WITH WHEELS!
(Understand the Basics of the Components)

ANALYSIS OF HYDRO SILENCER FOR EMISSION CONTROL IN IC ENGINES

In the IC engines while combustion of fuels, the toxic gases like CO2, NOx, HC,CO are to be released to the environment. These toxic gases are harmful, not only to the atmosphere but also to the human and animal race. The main objective of this project is to design & analysis a hydro silencer, where the toxic levels are controlled through chemical reaction to more reasonable level. In this the toxic gases are controlled by using nano particles likes aluminum, magnesium, limestone, charcoal are etc, the toxic content are to be reduced from the exhaust emissions. The whole assembly is fitted in the exhaust pipe. It does not give rise to any complications in assembling the unit in existing silencer. This system acts itself as a silencer there is no need to separate the silencer The analysis of CO2, NOx, HC, CO are done to the hydro silencer and compared with existing silencer. This system is very cost effective and more economical.

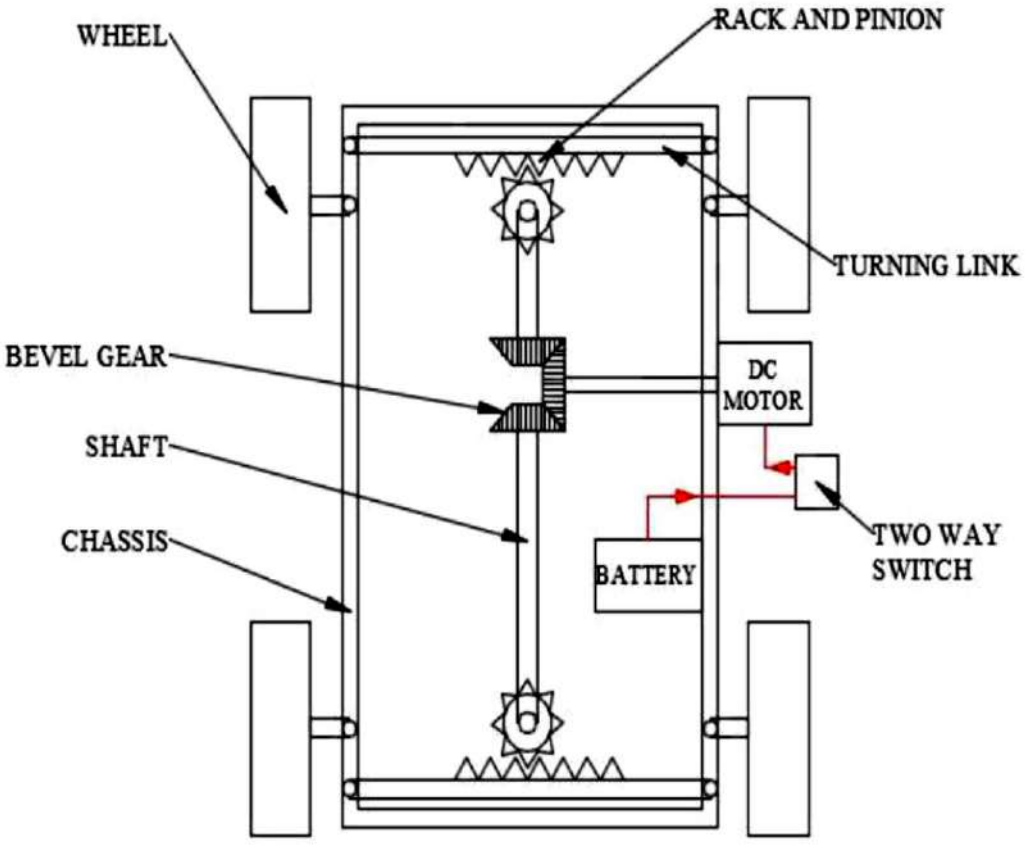


DEVADHARSHINI R

II-AE

ALTERNATABLE STEERING SYSTEM

Steering is the term applied to the collection of components, linkages, which will allow for a vehicle to follow the desired course. An exception is the case of rail transport by which rail tracks combined together with railroad switches provide the steering function. The most conventional steering arrangement is to turn the front wheels using a hand–operated steering wheel which is positioned in front of the driver. Other arrangements are sometimes found on different types of vehicles, for example, a tiller is rear–wheel steering. Tracked vehicles such as tanks usually employ differential steering that is, the tracks are made to move at different speeds or even in opposite directions to bring about a change of course. In convertible four wheel steering with three mode steering can be changed as needed which assists in parking at heavy traffic conditions, when negotiating areas where short turning radius is needed and in off road driving.



SANJEEV G S

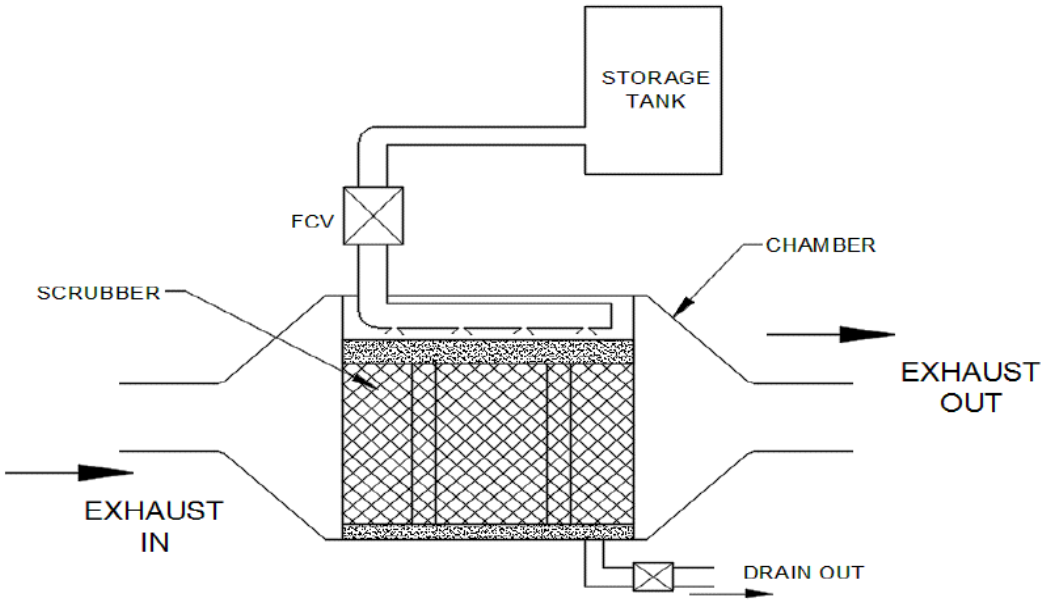
III-AE

EMISSION CONTROL SYSTEM BY WET SCRUBBER TECHNIQUE FOR IC ENGINE

Wet Scrubbers are air pollution control devices for removing particles and gases from automobile vehicle exhaust gases. It is operated by introducing the dirty exhaust gas with a scrubbing liquid as water. Then gases are collected in the scrubbing liquid. Wet scrubbers are usually the most appropriate air pollution control device for collecting both, particulate and gas in a single system alone. Its is help of control the air pollution

Wet scrubbers are a special device used to remove a variety of pollutants from exhaust gas from furnaces or other devices. These devices use a scrubbing liquid to remove the pollutants. The exhaust gas is moved through the scrubbing liquid (usually through a chamber) and the liquid is misted through the gas. The liquid most commonly used is water. A wet scrubber's particulate collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid.

Wet scrubbers are devices that remove pollutants from a exhaust gas. The goal in absorption and wet scrubbing equipment is the removal of gases and particulate matter from an exhaust gas by causing the gaseous contamination to become dissolved into the liquid gas and the solids to be entrained in the liquid. Low-risk processing of incendiary gases. Ability to handle high-temperature, high-humidity gas without temperature limit or condensation problems.

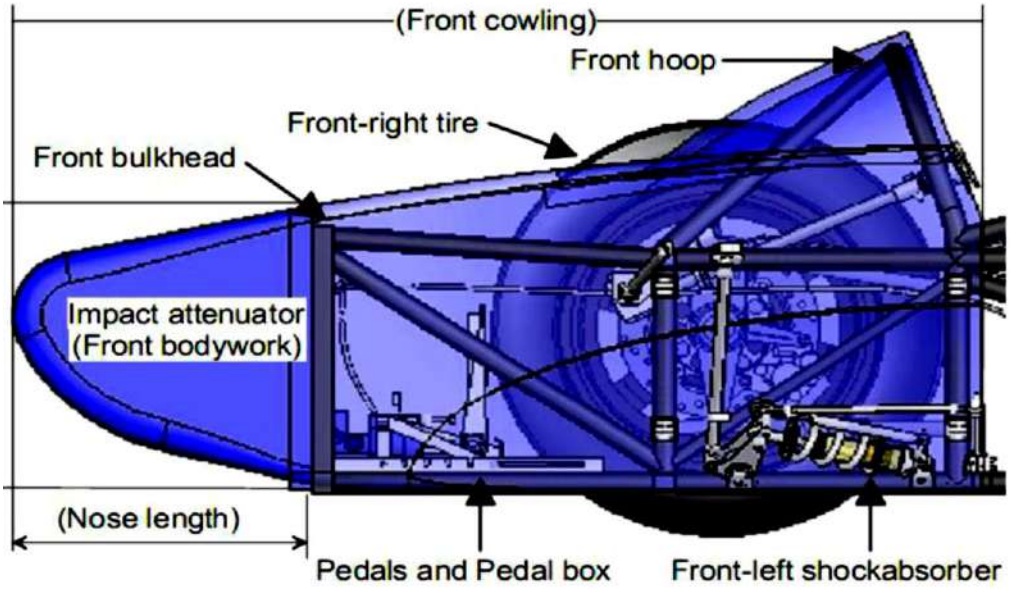


KIRUBASANKAR B V

III-AE

CRASHWORTHINESS OF IMPACT ATTENUATOR STRUCTURE OF A VEHICLE

Collision is a very plausible scenario in case of vehicles, owing to over speeding and reckless driving by the driver. As per research and real events it has been observed that in absence of safety equipment like seat belts and airbags a passenger undergoes a deceleration of more than 30G's in case of collision which is fatal for humans. After several tests, it has been affirmed by doctors that for deceleration less than 20G's the human body can sustain the impact force without any extenuating damages. This forms the benchmark for designing the Impact Attenuator for vehicles. Road accidents are now globally recognized as serious public health issue. The problem is much more serious in our country where roadway transportation is getting tougher day by day due to increased mass of driving vehicles and lack of awareness toward traffic sign and rules. In the motorsport world, especially in F1 racing vehicles a mechanical structure called an Impact Attenuator is used to prevent extreme damage to the vehicle chassis in the event of collision. The materials are normally used to making the attenuator are Aluminum Alloy and Al 2024 etc . The design of impact attenuators should be of lightweight materials, which may contribute to improving the acceleration performance and fuel economy of the vehicle. The structure of impact attenuator is of various types viz. tube and plate type, honeycomb structured, truncated trapezoidal shaped and sandwich structured so mostly aluminum alloy used for making an attenuator. Design of Passenger car attenuator is based on a Sandwich and Trapezoidal type

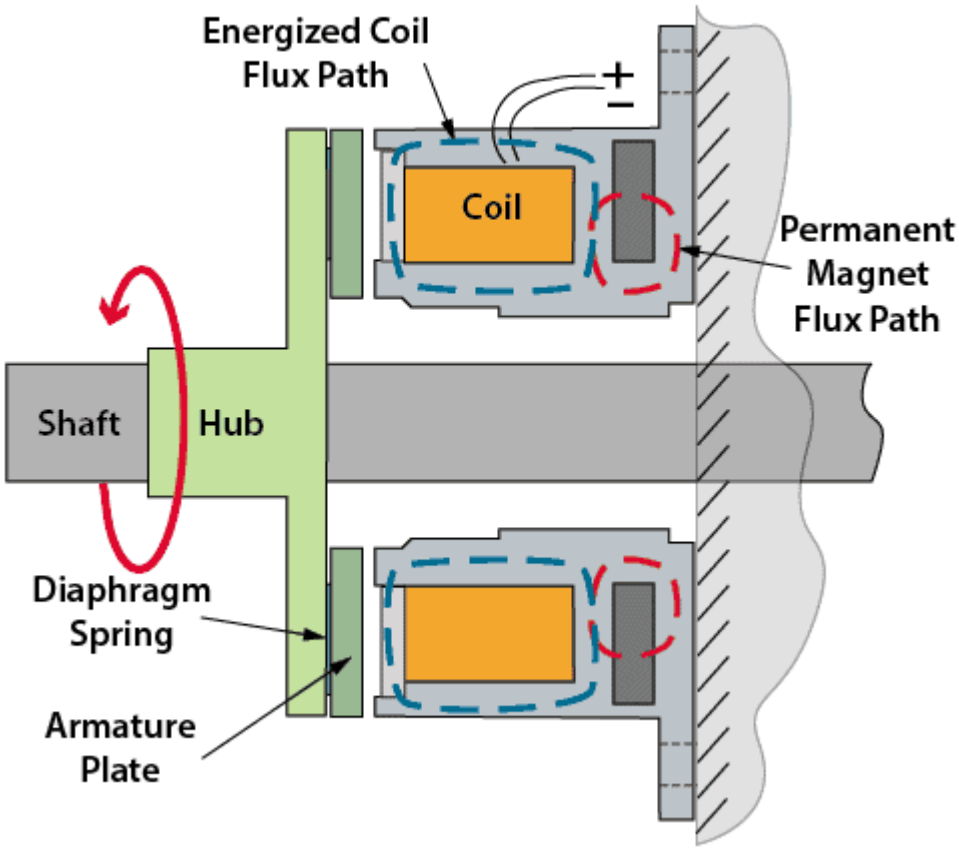


THAYAANAND D

II-AE

ELECTROMAGNETIC BRAKING SYSTEM

Braking system should ensure the safety and comfort of the passenger, driver and other road user. The brake must be strong enough to stop the vehicle during emergency within the shortest distance. The conventional braking system are bulky and power to weight ratio is low. Electromagnetic braking system is high-tech braking system find its use in small and heavy vehicle like car, jeep, truck, busses etc. This project represent about minimizing the brake failure in order to avoid the accident. It also reduces the maintenance of braking system. The effectiveness of brake should remain constant. The proper cooling of brake gives anti fade character and efficient operation of brake. Proper lubrication and maintenance must be done to operate brake safely, effectively and progressively with minimum fatigue to driver. This system provides better response time for emergency situations and in general keeps the friction brake working longer and safer.



VIDHYABATHI K
II-AE

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