



RVS COLLEGE OF ENGINEERING AND TECHNOLOGY

Kumaran Kottam Campus, Kannampalayam (Po), Coimbatore – 641 402
(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)

NAAC Accredited and ISO 21001:2018 certified Institution



DEPARTMENT OF MECHANICAL ENGINEERING

List of students undertaking Project work for the ACADEMIC YEAR 2022-2023

Participant List

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3.	712819114005	ARAVIND KUMAR C
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7.	712819114009	DHINESHKUMAR M
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18.	712819114023	SRIDHARAN M
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28	712819114702	JAYASURYA J
29	712819114703	MUNIASAMY M
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31	712819114705	SURIYA PRAKASH R
32	712819114706	VIJAYAKUMAR R
33	712819114707	SRIMANIKANDAN L
34	712819114708	SUNDAR M
35	712819114709	BOOPATHY E
36	712819114710	IRFAN S
37	712819114711	VIJAY P
38	712819114712	PACKIA YOOGARAJ A



RVS COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING
MAIN PROJECT LIST




Year/Sem : III/VI BATCH : 2019 - 2023

Academic Year : 2022-23 Even Sem

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	712819114007	ASHMIN		
	712819114017	MOHAMED SYED MUSTHFA U F		
	712819114710	IRFAN		
2	712819114002	AKASH S	IOT BASED SMART AGRICULTURE AND AUTOMOBILE SEED SOWING ROBOT	Prof.S.RAFICK
	712819114010	ESAI SELVAN A		
	712819114022	SENTHIL KUMAR S		
	712819114704	SARAN G		
3	712819114013	GOWTHAM G	DESIGN AND FABRICATION OF EXPANDABLE CHASSIS IN LORRY USING HYDRAULIC SYSTEM	Prof.T T NANJUNDA MOORTHII
	712819114015	KARTHIK KANNAN K		
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4	712819114025	SURYASEN S	DESIGN AND FABRICATION OF ECO FRIENDLY BICYCLE	Prof.V HARI GANESH
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	712819114703	MUNIYASAMY M		
	712819114705	SURIYA PRAKSH R		
5	712819114701	NAVANEETHAN K	DESIGN AND FABRICATION OF KINETIC ENERGY RECOVERY SYSTEM FOR BICYCLE	Prof.P.UTCHIMAHALI MUTHU RAJA
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6	712819114009	DHINESH KUMAR M	DESIGN AND FABRICATION OF INTELLENT BRAKING SYSTEM	N.SRI SARAVANAN
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	712819114708	SUNDAR M		
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7	712819114006	ARAVINTH R	DESIGN AND FABRICATION OF SOLAR AIR COOLER WITH HEAT	Prof.V.KAVITHA
	712819114008	ASWADEV K S		
	712819114011	FOUZAN AHAMED V		
	712819114707	SRIMANIKANDAN L		
8	712819114304	SHENBAGA AKASH S	DESIGN AND FABRICATION OF AUTOMATIC RAIN WATER GUTTER SYSTEM	Dr.V R.SIVAKUMAR
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	712819114712	PAKIYA YOOGARJ		
9	712819114003	AKHILESH SREEKUMAR	DESIGN AND FABRICATION OF PNEUMATIC LIFTER	Prof.G.YUVARAJ
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10	712819114012	GOKULAKRISHNAN R	OPTIMIZATION WITH MACHINE LEARNING AND TAGUCHI BASED METHOD OF PROCESS PARAMETERS ON SURFACE ROUGHNESS AND MRR OF HCHCR STEEL	Dr. CHANAKYAN. C
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**EXPERIMENTAL INVESTIGATION AND
IMPLEMENTATION OF COMPRESSED
AIR POWERED MOTORBIKE**



A PROJECT REPORT

Submitted by

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In partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

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RVS COLLEGE OF ENGINEERING AND TECHNOLOGY

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MAY 2023

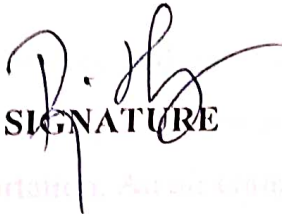
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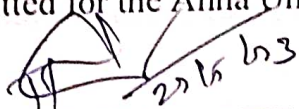

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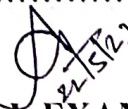
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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

Currently, pollution is a factor that needs to be taken into account in the interest of protecting the environment. The exhaust gases from vehicles are the main cause of pollution.

Life in the twenty-first century is very fast and many times knowingly or unknowingly we pollute our environment by using non-renewable energy resources in vehicles. We are excessively dependent on non-renewable energy resources we need to search possible chances in the alternative of fossil fuels in vehicles.

This has sparked our interest in this area of creating an environment free from pollution. The pressurized air cylinder might work well in place of the standard combustion engine.

Compressed air cylinder motorcycles might significantly cut carbon emissions, especially in areas where motorcycles are largely utilized for public transportation. An air compressor is used as the source of drive.

A bike running with compressed air as fuel is Air powered bike. It is a motorcycle which uses the compressed air as its power source so that it will be truly free of pollution for the environment.

Experimental analysis were carried out on this modified engine to find out its performance characteristics like brake power, mechanical efficiency, overall efficiency, air to Air ratio, volumetric efficiency, cost analysis etc.

CHAPTER 7

CONCLUSION

We were able to successfully complete the design and fabrication of air engine. By doing this project we gained knowledge about pneumatic system and working of IC engines using compressed air. We also learned how automation can be effectively done with the help of pneumatic system.

The air driven engine provides effective method for power production and transmission even though its application are limited currently, further research could provide wider applications.

The air bike which we made can be used for handicapped people. The design is actually made for them. Due to only presence of one cylinder there won't be over speeding the speed limit is 25km/hr

Currently the number of people who can travel on it is one. If the chassis and power of engine get changed then the number of people can increase

Advantages:

- Less costly and more effective
- The air engine is an emission-free piston engine that uses compressed air as a source of energy
- Simple in construction. The engine can be massively reduced in size
- Easy to maintain and repair
- Low manufacture and maintenance costs



**IOT BASED SMART AGRICULTURE
AND AUTOMATIC SEED SOWING
ROBOT**



A PROJECT REPORT

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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

In today's era all sectors are moving towards the rapid growth using many advanced technologies. Of all these sectors, agriculture is also one of them. In order to meet the increasing demand of food, farmers have to implement advanced techniques so that the soil texture is not affected and the overall food production is increased. Hence, in this project we aim at designing and fabricating a solar operated seed sprayer machine. Seed sowing process is usually carried out by humans using manual power. In this solar seed sprayer machine project, seed in a hopper gets sprayed by means of fan or blower directly to the land without any manual effort. Using this process, the seeds are fed in the land during the time of plough. The main advantage of using this technique is that, it reduces the time of seed to land and reduces human efforts. In this solar agriculture sprayer solar panel is used as power source which is used to run the fan, and thus does not require any additional power supply. This innovative mechanical project of seed sowing equipment can save more time for sowing process and also it reduces a lot of labor cost. This solar agro sprayer project is very helpful for small scale farmers. The Internet of Things (IoT) describes the network of physical objects "things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet.

CHAPTER-10

CONCLUSION

The project carried out by us made an impressive task in the field of agricultural sector. The multi utility agricultural machine is very usefully for the workers to carry out a number of operations in a single machine. Practically our multi utility agricultural machine can be used for seed sowing, ploughing. All the parts are arranged in such a way that in every stage of agriculture, the equipment can be rearranged to perform the specified action. Our team has successfully combined many ideas from various fields of mechanical engineering and agricultural knowledge to improve the yield and by reducing the labour effort and expenses. The whole idea about multipurpose equipment is a new concept, patentable and can be successfully implemented in real life situations. More operations can be included to the vehicle like soil leveler, grass cutter and many other machines for various operations. Also engine can be used to drive the equipment which will reduce the work load. The tyre can be changed according to the type of the land. The plough tool tip arrangement is made separately, so in case of breakage the tip of the tool is alone changed. A steering mechanism can also be done for the ease of control.



DESIGN AND FABRICATION OF EXPANDABLE CHASSIS IN LORRY USING HYDRAULIC SYSTEM



A PROJECT REPORT

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INTERNAL EXAMINER



EXTERNAL EXAMINER

ABSTRACT

Chassis is one of the important part of the any automobile. It plays crucial role in the heavy load carrying capacity vehicles like containers. It acts as a back bone of the vehicle. The chassis supports the engine, cabin and suspension system of the vehicle. The main function is to carry the maximum load for any designed condition. The chassis is nearly designed for a load of 10 to15 tons. Under this load it may be subjected to shocks, impact loads due to uneven roads. It also absorbs drive line torque endure torque load on uneven road surfaces. The chassis contains cross members of different cross sections. The chassis is of a ladder shape.

The aim is to design the truck by changing the length by using hydraulic system. Instead of procuring larger length, we can expand it by using hydraulic system. So we do not need the large trucks for this operation. Hydraulics is a mechanical function that operates through the force of liquid pressure. In hydraulics based systems, mechanical movement is produced by contained, pumped liquid, typically through hydraulic cylinders moving pistons.

CHAPTER X

CONCLUSION

A method for performing design oriented calculations investigating the three load cases, Lateral Loading, Frame Torsion and Vertical Load on Kingpin have developed.

- Three load cases have been established in the Generative Assembly Structural analysis module of Catia (GAS). The setup of the model is by a large margin the most time consuming part of the process.
- The load cases have been verified by comparisons to Abacus references. The difference in deformation and stress levels between the Cation model and Abacus reference are varying depending on the load case. The Lateral Loading case shows less sensitivity to the differences in suspension stiffness compared to the Frame Torsion case.
- The impact from differences in calculation software have been considered and highlighted. The effect on the global deformation of the Abacus reference due to Geometrical literariness is negligible. The effect due to contact nonentities is considerable.
- The analysis setup time have been made considerably shorter by use of script based on automation. This approach to analysis setup is a potent time saving possibility. Implementing fully automated analysis setup is conceivable.
- A method of utilizing sub modeling for reducing the computation time has complemented. The method allows for importing deformations from other FEM



DESIGN AND FABRICATION OF ECO FRIENDLY BICYCLE



A PROJECT REPORT

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MAY 2023

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INTERNAL EXAMINER



EXTERNAL EXAMINER

ABSTRACT

There are so many vehicles that came to influence in the existing world. Their operating systems are based on usual fossil fuel system. At the present sense the fossil fuel can exceed only for a certain period after that we have to go for a change to other methods. Thus, we have made an attempt to design and fabricate an ultimate system (Self charging electric bicycle) which would produce cheaper & effective result than the existing system. This will be very useful to the future needs of the world.

An attempt is made in the fabrication of a solar powered System for a two-wheeler (Cycle). This works on electric power distributed by the DC electric motor receiving the current from a battery. The motor and the various parts are such as sprocket, chain assembly, cycle and with easily available materials to serve and fulfill the purpose of the project. Battery is charged by using solar panel.

The drive system of the normal Cycle is not altered. This system is two in one system. The cycle is operated either by

1. Pedaling manually
2. Battery and motor driving mechanism.

CHAPTER-12

CONCLUSION

This project work has provided us an excellent opportunity and experience, to use our limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We feel that the project work is a good solution to bridge the gates between institution and industries.



FABRICATION OF KINETIC ENERGY RECOVERY SYSTEM FOR BICYCLE



A PROJECT REPORT

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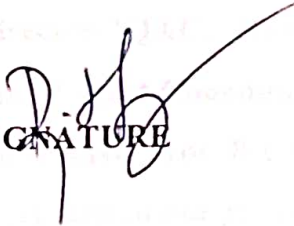
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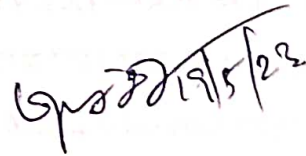
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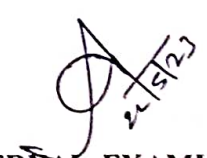
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INTERNAL EXAMINER



EXTERNAL EXAMINER



ABSTRACT

Kinetic Energy Recovery System, commonly abbreviated KERS, is a system to recover the Kinetic energy of a moving vehicle under braking. This system stores the kinetic energy in the form of potential energy and converts it back to kinetic energy when needed. When riding a bicycle I become too tiresome to start the bicycle again after braking. If the bicycle is provided with a kinetic energy recovery system then the rider will have two power sources that he can use at his will. When brakes are applied kinetic energy is wasted because the kinetic energy converts into heat energy due to friction at the contact surface and the heat energy dissipates into the atmosphere due to thermal radiation. Vehicles equipped with KERS devices are able to take some of its kinetic energy out slowing down the vehicle. This is a form of braking in which energy is not wasted, instead gets stored in some device. Using a proper mechanism, this energy that is stored in terms of potential energy can be converted back into kinetic energy to give the vehicle an extra boost of power. In the literature review different types of available KERS systems are compared and a mechanical based KERS System is found to be the best suitable for a bicycle. Mechanical KERS system there are of two types, one is a clutch based and another is a CVT based K.E. recovery system. In this project a hybrid of the about two type of KERS systems is designed. Instead of CVT a variable sprocket ratio is used to make the power transmission smoother. Finally the complete manufacturing process of this KERS system is explain elaborately so that any researcher can follow those steps and design a KERS system for his/her bicycle.

CHAPTER:11

CONCLUSION:

In this project a flywheel based KERS system was designed. The product designed in this project is a hybrid of clutch and CVT 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.



DESIGN AND FABRICATION OF INTELLIGENT BRAKING SYSTEM



A PROJECT REPORT

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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

The aim is to design and develop a control system based on intelligent electromagnetically controlled braking system is called INTELLIGENT BRAKING SYSTEM. This Braking system is consisting of ultrasonic sensor unit, Electromagnetic braking system. The Ultrasonic sensor is used to detect the obstacle distance in LCD display. The obstacle closer to the vehicle the control signal is given to the braking system. The Electromagnetic braking system is used to break the vehicle.

In our project of ULTRASONIC DISTANCE METER is suitable for measuring distances 50cm. The measured distance is shown on a 3-digit liquid crystal display (LCD).

This project aims to create an electromagnetic braking system model capable of applying brakes without any friction loss and without losing the energy supplied. It uses electromagnets which runs by the supply of power from the circuit. Also, there is a wheel which is attached to the motor so when the power the supplied, by the help of motor the wheel rotates. Then a fan is attached near electromagnets to cool the electromagnets from excessive heating.

A metal bar is in the vicinity of the electromagnets and wheel so when the electromagnets produce eddy currents which stops the rotating wheel or rotor. This model helps in a way to be a used a retardation equipment in vehicle.

CHAPTER -12

CONCLUSION

This project work has provided us an excellent opportunity and experience, to use our limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We feel that the project work is a good solution to bridge the gates between institution and industries.

Intelligent braking system represents a significant advancement in automotive safety technology, and has the potential to protect vehicles and prevent serious damages. As the technology becomes more widespread, it is likely that we will see continued improvements in vehicle safety, and a reduced number of accidents on the road.

We are proud that we have completed the work with the limited time successfully. The **INTELLIGENT ELECTROMAGNETIC BRAKE** is working with satisfactory conditions. We are able to understand the difficulties in maintaining the tolerances and also quality. We have done to our ability and skill making maximum use of available facilities.

In conclusion remarks of our project work, let us add a few more lines about our impression project work. Thus, we have developed an **“INTELLIGENT BRAKING SYSTEM”** which helps to know how to achieve low-cost automation. The application of pneumatics produces smooth operation. By using more techniques, they can be modified and developed according to the applications.



SOLAR AIR COOLER WITH HEATER



A PROJECT REPORT

Submitted by

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Of

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IN

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INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

Solar Air cooling is Comfort cooling system for human by using non-conventional energy. This project would be fruitful in both domestic & industrial backgrounds. Solar air conditioning does not use any Freon or other hazardous chemicals. Solar energy may be the best way to obtain replenishes able power.

Mechanical Engineering without production and manufacturing is meaningless and inseparable. Production and manufacturing process deals with conversion of raw materials inputs to finished products as per required dimensions, specification and efficiently using recent technology. The new developments and requirements inspired us to think of new improvements in air conditioning Engineering field. Nowadays heater as well as cooler is available in market separately. Hence, we decided to take over both applications in a same system. It's a new step ahead in air conditioning Engineering field.

The objective of this project is to find necessities enlivened us to consider new changes in cooling system by using nonconventional energy. Sun oriented power is the innovation of changing over daylight specifically into power. It depends on photograph voltaic or sun-oriented modules. Abundant source of Sunlight is useful in reducing the cost of electric power in Solar Air cooler. Solar air conditioning has great potential.

Our project fulfilled all our requirements as our thoughts. Heater can be used in winter and cooler in summer. Hence it is a multipurpose project. Our project is vital one to the environment. In our project, solar power is stored in a battery. This power is used to run the air cooler whenever we required. The heating coil works with a D.C supply which is drawn supply from battery. Solar energy means all the energy that reaches the earth from the sun. It provides

CHAPTER – XII

CONCLUSION

By completing this project, we have achieved a clear knowledge of comfort cooling system for human by using non-conventional energy and heating system by power supply. This project would be fruitful in both domestic & industrial backgrounds.

We also know about non-conventional energy sources and utilization.

SCOPE OF IMPROVEMENT:

This project although fulfilling our requirement has further scope for improvements. Some of the improvements that could be made in this solar air cooler unit are listed below.

- By adding solar panel auto tracking system
- By adding some components to make solar heater cum cooler



DESIGN AND FABRICATION OF AUTOMATED RAIN GUTTER SYSTEM



A PROJECT REPORT

Submitted by

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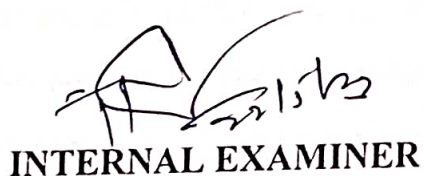

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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

Over the years of the rising population, practices that increase demand for water supply and electricity have grown in industries as well as in the expansion of agriculture.

Monsoon is still the main hope and the source of our agriculture. In this perception, water-saving has become a necessity for mankind.

Rainwater harvesting is a way to capture rainwater at the time of the downpour, store the water above the ground or download the underground water and use it later. Presently, rainwater harvesting is being carried out by the method of using the pathway at rooftops.

But, the accumulation of dry leaves and microbial contamination in the rainwater pathway blocks the outlet and degrades the quality of water. The above mentioned problem will be addressed in the present investigation, which aims to design an automated rainwater pathway, thereby enabling the collection of pure water.

This system will make use of a mechanism that will be actuated by a rain gutter which is actuated by a motor, controlled by a rain sensor.

CHAPTER-X

CONCLUSION

By the realization of the present work which aims to save water and replenish the underground freshwater, we will be able to accomplish saving water up to a huge extent for drinking and other domestic purpose and for future needs.

The demand for water will be crucial in coming years and policies for implementing rainwater harvesters in every house will be mandatory. Their function becomes increasingly more important and challenging once they begin to be used for collecting water to be used for drinking.

This project will help in the accomplishment of the aforementioned objective and in socioeconomic development.

The project carried out by us made an impressive task in the field of home and industrial. This project has also reduced the cost involved in the concern. Project has been designed to perform the entire requirement task which has also been provided.



DESIGN AND FABRICATION OF PNEUMATIC LIFTER



A PROJECT REPORT

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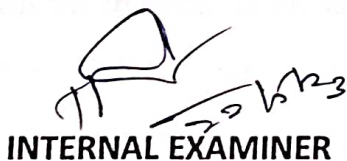
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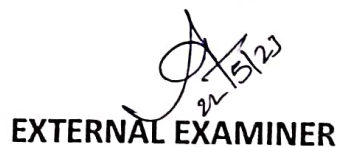
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INTERNAL EXAMINER



EXTERNAL EXAMINER

ABSTRACT

- This project is developed for the users to lift any weight using air pressure. High pressure air is stored in a tank. A cylinder with piston arrangement is connected with a zig-zag pattern. Two pipes connected with ball valves connect the air tank with the cylinder. When one valve is opened, the air rushes out into the cylinder. Therefore, the piston moves in one direction.
- The rod connected with the piston pushes the zig-zag frame so that the lift moves up. When the other ball valve is opened, the air inside the cylinder is released. Therefore, the lift comes down.
- The Pneumatic lifter is a mechanism to lift blocks, bricks, cotton bale, wood log and some over weighted objects with the help and power of pneumatic cylinder.
- With the help of pneumatics, the fork mounted in front can move up and downwards to lift the object, after lifting the weight the object can be transported from working place to stacking place or to load and unload the object.

CHAPTER 6

6. CONCLUSION

We were able to successfully complete the design and fabrication of pneumatic lifter. By doing this project we gained knowledge about pneumatic system and uses of compressed air. We also learned how to weld structures properly and orderly and effectively. And the working principles and seals, o-rings about pneumatic system.



**OPTIMIZATION WITH TAGUCHI BASED S/N
RATIOS METHOD OF CNC TURNING PROCESS
PARAMETERS ON HCHCr STEEL FOR SURFACE
ROUGHNESS AND MRR**



A PROJECT REPORT

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INTERNAL EXAMINER

EXTERNAL EXAMINER

Abstract

The current investigation is, to determine the optimum process variables on CNC turning operation of High Carbon High Chromium Die steel (HCHCr) using Taguchi based S/N ratio method. In this Taguchi, optimum level of turning variables can be identified by the larger the better option with ANOVA as the performance index. In present work, the three turning variables were chosen namely cutting speed ($V1 = 1500$ rpm, $V2 = 2000$ rpm and $V3 = 2500$ rpm), feed rate ($F1 = 0.3$ mm/rev, $F2 = 0.6$ mm/rev and $F3 = 0.9$ mm/rev) and depth of cut ($D1 = 0.10$ mm, $D2 = 0.15$ mm and $D3 = 0.20$ mm) and the output responses such as material removal rate (MRR) and surface roughness (SR) were considered. Taguchi S/N ratio was used to identify the optimum turning process variables on multi response characteristics with an objective to maximize the MRR and minimize the SR. Based on the Taguchi method, optimum level of turning variables was identified as V3F3D2 that is cutting speed at level 3 (2500 rpm), feed rate at level 3 (0.9 mm/rev) and depth of cut at level 2 (0.15 mm). The significant effect of each variable on response was determined by analysis of variance (ANOVA). From ANOVA result shows that DOC was the most significant factor on multi response characteristics followed by cutting speed and feed rate. Finally, the verification test was performed to validate the experimental results.

Keywords: HCHCr, Feed, Speed, DOC, Taguchi

CHAPTER-6

CONCLUSIONS

1. Taguchi method of experimental design has been applied for optimizing multi-response process parameters for CNC turning of HCHCr by using L9 orthogonal array.
2. Results obtained from Taguchi method exactly matches with ANNOVA.
3. From Measured Response Table, Feed rate is the most influencing parameter for minimum surface finish which is followed by depth of cut and cutting speed.
4. From Measured Response Table, best parameters found for minimum surface finish machining are feed rate= 0.3mm/min, cutting speed = 2500rpm and depth of cut= 0.15mm/rev.
5. The parameters found for rough machining are feed rate= 0.9mm/min, cutting speed = 1500rpm and depth of cut= 0.2mm/rev.
6. From Measured Response Table Depth of cut is the most influencing parameter for material removal rate which is followed by feed and cutting speed.
7. From Measured Response Table, best parameters found for minimum surface finish machining are feed rate= 0.3mm/min, cutting speed = 2500rpm and depth of cut= 0.15mm/rev.
8. The parameters found for rough machining are feed rate= 0.9mm/min, cutting speed = 1500rpm and depth of cut= 0.2mm/rev.



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4.	712820114005	JAYAPRAKASH G
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11.	712820114306	ARISH KUMAR S
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13.	712820114320	HARIPRASATH G
14.	712820114321	JEEVANANDHAM N
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16.	712820114350	VASANTHA KUMAR K
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DESIGN AND FABRICATION PROJECT TITLE LIST



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Academic Year : 2022-23 Even Sem

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2	712820114003	DINESHKUMAR S	Design and Fabrication Zero Turning Mechanism and Four Wheel Steering	Mr. V.HARI GANESH
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DESIGN AND FABRICATION OF MODIFY DIFFERENTIAL UNIT

A PROJECT REPORT

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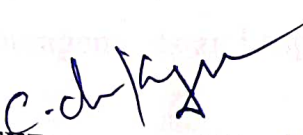
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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

The conventional differential supplies almost equal amount of torque to the wheels on the straight path but the problem arises when wheels goes under the action of turning. This dissertation concentrates on introducing Automatic Locking System in the conventional differential unit of an automobile so that a perfect distribution of the torque can be achieved when the vehicle takes a turn and the problems like spinning of wheels are overcome. Engagement or disengagement of this locking system can be activated manually or automatically depending on the driving conditions. If the difference in the speed of driven and rolling wheels is encountered then the differential is exposed to automatic locking. Some additional attachments of shafts and power transmission devices is done to achieve the locking of differential which results in exact distribution of torque so that perfect turning of the vehicle is performed.

Key Words:

conventional differential, torque, Automatic Locking System, spinning of wheels, power transmission, perfect turning

CHAPTER X

CONCLUSION

A strong multidiscipline team with a good engineering base is necessary for the Development and refinement of advanced computer programming, coating techniques, diagnostic Software, algorithms for the dynamic exchange of information at different levels of hierarchy.

This project work has provided us an excellent opportunity and experience, to use our limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work.

We are proud that we have completed the work with the limited time successfully. The "**FABRICATION OF DIFFERENTIAL UNIT**" is Working with satisfactory conditions. We are able to understand the difficulties in maintaining the tolerances and also quality.



DESIGN AND FABRICATION OF LINE FOLLOWER ROBOT

A PROJECT REPORT

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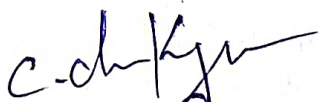

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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

Line Following is one of the most important aspects of robotics. A Line Following Robot is an autonomous robot which is able to follow either a black line that is drawn on the surface consisting of a contrasting colour. It is designed to move automatically and follow the line.

The robot uses arrays of optical sensors to identify the line, thus assisting the robot to stay on the track. The array of two sensors makes its movement precise and flexible. The robot is driven by DC gear motors to control the movement of the wheels. The DC gear motor is driven by the motor driven circuit.

This project aims to implement the algorithm and control the movement of the robot by proper tuning of the control parameters and thus achieve better performance. It can be used in industrial automated equipment carriers, small household applications, tour guides in museums and other similar applications, etc.

CHAPTER-04

CONCLUSION

In its current form robot is enough capable. It can follow any curve and cycle. We must build a robot that has light weight and high speed because points are awarded based upon the distance covered and the speed of the overall robot.

Therefore, we used two high speed motors and high sensitivity sensors circuit. The body weight and wheels radius have effects on speed, too. The weight of the designed robot is around 300 gram and it can be lighter. To get better maneuver, we must build a robot that uses two motors and two wheels on the rear and a free wheel on the front

. The power supply is 12 with regulator. The designed robot has eight infrared sensors on the bottom for detect line. Microcontroller ATMega16 and driver L298 were used to control direction and speed of motors. The robot is controlled by the microcontroller. In performs change the motor direction by giving signal to driver IC according to receives signals from sensors.



**DESIGN AND FABRICATION
HYDRAULIC BEARING PULLER**

MINI PROJECT REPORT

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ABSTRACT

Hydraulic system plays very important role in almost all the application. As in automobile industries, small service center, aircraft industries and used where precision is required. Traditional method of bearing removal or installation is hammering, but unnecessary hammering causes several problems. The unsafe and excessive hammering cause's damage of bearing surface or sometimes chance to failure and excessive human effort required. In order to remove or installed bearing safely, to make modification in traditional method. The modification made in easy removing and installing bearing. The purpose of modification are required less human effort , simplicity of operation , removing and installing bearing done without damaging bearing surface, compact, portable and well suited .the hydraulic bearing puller based on hydraulic system on the principle of pascal's law which states that " pressure distribution in enclosed cylinder is uniform in all direction.

CONCLUSION

In order to remove and installed bearing safely, to make modification in traditional method. The modification made in easy removing and installing bearing. The purposes of modification are Simplicity of operation, removing and installation of bearing done without damaging bearing surface, compact, portable, well suited, low cost, Multifunctional safe, versatile and individual can lift a load weighing several ton.



DESIGN AND FABRICATION OF AIRCOLER SYSTEM WITH SOLAR METHOD



A PROJECT REPORT

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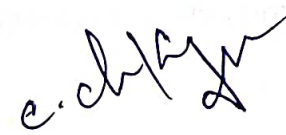
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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

Solar Air cooling is Comfort cooling system for human by using non-conventional energy. This project would be fruitful in both domestic & industrial backgrounds. Solar air conditioning does not use any Freon or other hazardous chemicals. Solar energy may be the best way to obtain replenishes able power.

Mechanical Engineering without production and manufacturing is meaningless and inseparable. Production and manufacturing process deals with conversion of raw materials inputs to finished products as per required dimensions, specification and efficiently using recent technology. The new developments and requirements inspired us to think of new improvements in air conditioning Engineering field. Nowadays heater as well as cooler is available in market separately. Hence, we decided to take over both applications in a same system. It's a new step ahead in air conditioning Engineering field.

The objective of this project is to find necessities enlivened us to consider new changes in cooling system by using nonconventional energy. Sun oriented power is the innovation of changing over daylight specifically into power. It depends on photograph voltaic or sun-oriented modules. Abundant source of Sunlight is useful in reducing the cost of electric power in Solar Air cooler. Solar air conditioning has great potential.

Our project fulfilled all our requirements as our thoughts. Heater can be used in winter and cooler in summer. Hence it is a multipurpose project. Our project is vital one to the environment. In our project, solar power is stored in a battery. This power is used to run the air cooler whenever we required. The heating coil works with a D.C supply which is drawn supply from battery. Solar energy means all the energy that reaches the earth from the sun. It provides

daylight makes the earth hot and is the source of energy for plants to grow. Solar electricity is the technology of converting sunlight directly in to electricity. It is based on photo-voltaic or solar modules, which are very reliable and do not require any fuel or servicing.

Our objective is to design and develop a solar system normally **“SOLAR AIR COOLER”**.

Humans give off heat, at an average of 100 kcal per hour per person. This is what is known as ‘metabolism’. The temperature inside a human within the human body (internal body temperature) is about 37°C (98.4 degree F). But the skin temperature varies according to the surrounding temperature and relative humidity. To dissipate the heat generated by metabolism in order to maintain the body temperature at the steady level, there must be a flow of heat from the skin to the external world.

If the surrounding temperature is slightly less than the body temperature, there will be steady flow of heat from the skin. But in the surrounding temperature being very low, as on a cold winter day, the rate of heat flow from the body will be quite high. Thus the person feels cold. On the other hand, on a hot summer day, the surrounding temperature is higher than that of the body, and so there is steady flow of heat from the skin to the surroundings. Thus the person feels hot. In such a situation, water from the body evaporates on the skin surface and cools the water from the body evaporates on the skin surface, absorbing the heat due to metabolism. This helps in maintaining a steady body temperature. But if the surroundings are not only hot but highly humid as well, very little evaporation of water takes place from the skin surface, and so the person feels hot and uncomfortable.

CHAPTER – XII

CONCLUSION

By completing this project, we have achieved a clear knowledge of comfort cooling system for human by using non-conventional energy and heating system by power supply. This project would be fruitful in both domestic & industrial backgrounds.

We also know about non-conventional energy sources and utilization.

SCOPE OF IMPROVEMENT:

This project although fulfilling our requirement has further scope for improvements. Some of the improvements that could be made in this solar air cooler unit are listed below.

- By adding solar panel auto tracking system
- By adding some components to make solar heater cum cooler



DESIGN AND FABRICATION OF FLEXIBLE CHASSIS IN HEAVY VEHICLE WITH HYDRAULIC SYSTEM



A PROJECT REPORT

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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

Chassis is one of the important part of the any automobile. It plays crucial role in the heavy load carrying capacity vehicles like containers. It acts as a back bone of the vehicle. The chassis supports the engine, cabin and suspension system of the vehicle. The main function is to carry the maximum load for any designed condition. The chassis is nearly designed for a load of 10 to15 tons. Under this load it may be subjected to shocks, impact loads due to uneven roads. It also absorbs drive line torque endure torque load on uneven road surfaces. The chassis contains cross members of different cross sections. The chassis is of a ladder shape.

The aim is to design the truck by changing the length by using hydraulic system. Instead of procuring larger length, we can expand it by using hydraulic system. So we do not need the large trucks for this operation. Hydraulics is a mechanical function that operates through the force of liquid pressure. In hydraulics based systems, mechanical movement is produced by contained, pumped liquid, typically through hydraulic cylinders moving pistons.

CHAPTER X

CONCLUSION

A method for performing design oriented calculations investigating the three load cases, Lateral Loading, Frame Torsion and Vertical Load on Kingpin have developed.

- Three load cases have been established in the Generative Assembly Structural analysis module of Catia (GAS). The setup of the model is by a large margin the most time consuming part of the process.
- The load cases have been verified by comparisons to Abacus references. The difference in deformation and stress levels between the Cation model and Abacus reference are varying depending on the load case. The Lateral Loading case shows less sensitivity to the differences in suspension stiffness compared to the Frame Torsion case.
- The impact from differences in calculation software have been considered and highlighted. The effect on the global deformation of the Abacus reference due to Geometrical literariness is negligible. The effect due to contact nonentities is considerable.
- The analysis setup time have been made considerably shorter by use of script based on automation. This approach to analysis setup is a potent time saving possibility. Implementing fully automated analysis setup is conceivable.
- A method of utilizing sub modeling for reducing the computation time has complemented. The method allows for importing deformations from other FEM



**FABRICATION OF FOOT STEP POWER
GENERATION**



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CHAPTER 1

ABSTRACT

In present day, power has become the fundamental need for human life. The availability and its conjunction is regarded as the index of national standard of living in the present day of civilization. Energy is an important input in all sectors of any countries economy. The objective of this project is to design a setup that leads to generating electricity .the energy which is going waste when human climb the stairs. This human energy is utilized and converted into electrical energy. This generated energy is cost effective and non-hazardous for human. Power can be generated through stepping on the stairs, the generated power will be stored and can be used for domestic purpose. To obtain the above purpose, the experimental setup is designed which contains the structure, dome, rack, spur gear, bearings, , shaft, springs, and dynamo. The working principle is based on law of energy i.e. mechanical energy is converted into electrical energy. When force is applied on footstep rack and spring get compressed therefore the pinion is rotated. This rotates the chain drive arrangement. The flywheel is coupled with chain drive to regulate the fluctuation and finally the dynamo is connected with the shaft. Thus reciprocating energy is converted into rotating energy and mechanical energy is converted into electrical energy. The energy generated is risk free and pollution free. The way of energy generation is eco-friendly and non-hazardous to human. The output of energy increases as weight increases. The electricity is produced in low budget when mass production and installation is done. The required area is low, no obstructions in traffic, easy maintenance and construction.

CHAPTER 8

CONCLUSION AND REFERENCE

CONCLUSION

Energy is an important input to sustain industrial growth and standard of living of a country and can be directly related to energy consumption. The conventional sources energy like coal, oil, uranium etc are depleting very fast and by the turn of the century man will have to depend upon non conventional sources of energy for power generation.

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**DESIGN AND FABRICATION OF
AUTOMATIC HEAD LAMP
ALIGNMENT SYSTEM**



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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

As for Indian road transport scenario is concerned, accidents are becoming a day to day cause an attempt has been made in this project to reduce such mishaps. In our project of “**AUTOMATIC HEAD LAMP ALIGNMENT SYSTEM**” having the following operation occurs automatically in the vehicle.

These type of headlights appeared on production cars in the 1920's and are still around nowadays, but not very popular, although they make night time driving safer. The most famous car which featured these lights was the Citroen DS (1955-1975), introduced on the 1968 Paris Motor Show. The headlights can be connected to the steering linkage by means of rods or cables, operated hydraulically by the power steering or nowadays electronically adjusted, even controlled by satellite navigation system.

Our project is to make new and modern “Directional Headlights” in efficient manner by increasing the light angle. Directional headlights are those headlights that provide improved lighting especially for cornering. There are automobiles that have their headlights directly connected to the steering mechanism so that its lights will follow the movement of the front wheels.

Our project comprises Cam and Follower mechanism, Gear mechanism and spring mechanism. Cam and Follower mechanism is used to turn the head lights to right or left direction, Gear mechanism is used to transmit motion and to reduce the no of rotations from steering rod to cam shaft. Spring mechanism is used to bring back the follower and head light bracket to its initial position.

According to our project, when the steering steers to the right, the light bracket at right alone steers to right using cam & follower mechanism and reduction gears & vice versa. At the same time the left bracket remains stand still due to the dwell period of the cam. During the return stroke of cam, the spring mechanism is used to bring the bracket and follower to its initial position. The reduction gears are used to turn the brackets to the required angle respective to the steering rotation.

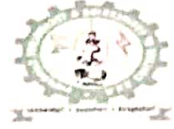
Our project will be useful for vehicles, which are been used in hill areas



The 1968 Citroen DS featuring directional- headlights

CONCLUSIONS

Before we undertook this project our knowledge about directional headlights was limited. After doing an extensive research for this project we have a wider knowledge of this field in automotive technology, learnt useful information about different types of directional headlights. We have searched the library of the college for relevant books and the internet for additional information. During the build of an experimental model of directional headlights on a vehicle we have improved our DIY skills and technical problem solving ability .Carrying out test with the project vehicle has proved that this concept works and although such lights are not widely used even nowadays, it does support the driver's vision during night-time driving, helps to reduce black spots while cornering and therefore reduces the risk of accidents, by helping to notice persons or objects hidden in a bend earlier in advance. We are looking forward to see more road vehicles equipped with directional headlights in serial production.



**DESIGN AND FABRICATION OF
SHEET BENDING MACHINE**

A PROJECT REPORT

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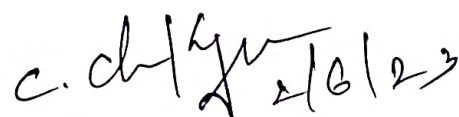

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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

Bending process has been a core step in fabricating and manufacturing products nowadays. As the industries are rapidly growth, the demand in machineries is also growing including the bending machine. However, for personal and light use, commercial bending machine are rather expensive and heavy. Thus, this study intended to design, fabricate, and analyze a low-cost manually operated bending machine for light use. The bending machine was design based on the intended function and the ergonomics to users particularly Malaysian. The bending machine was first designed and then fabricated using mild steel as its main materials due to its high hardness and easy to be welded. Then, the bending machine was tested to pressed two different size and two different thickness of aluminium sheet. Then, Finite Element Analysis was conducted on the bending machine's component which are bender plate and bending base to find the allowable maximum stress and deformation. The findings shows that the bending machine are able to bend both large and small aluminium plate thickness 1.0 mm and below without facing any part deformation or failures.

CHAPTER-5

CONCLUSION

The mechanism is widely used in industry to for bending purposes. The machine is made with a supporting frame that supports the roller mechanism between it. The work to be bent can then be rolled across it to achieve desired bending. The rollers are fitted with bearings so as to achieve the desired smooth motion.

From the above results and discussion it can be observed that the theoretically calculated result follows the experimentally obtained results. The three parameters as thickness, diameter and width of pipe are considered. Out of these three parameters one parameter is varied by keeping other. two parameters as constant. Effect of varying parameter on number of passes and time required for manufacturing pipe is studied, which is discussed in results and discussion. These theoretical equations are useful for companies working in the area of pipe manufacturing. Also the productivity analysis is carried out.

Now we know that Pneumatic cutting and bending machine is very cheap as compared to hydraulic cutting and bending machine. The range of the cutting and bending thickness can be increased by arranging a high pressure compressor and installing more hardened blades. This machine is advantageous to small sheet metal cutting and bending industries as they cannot afford the expensive hydraulic cutting and bending machine.

Comparative study of manually operated sheet bending machine and power operated sheet bending machine has been done. Also, productivity of both the machines has been calculated. From the results, it is cleared that, productivity



DESIGN AND FABRICATION OF INTELLIGENT BREAKING SYSTEM



A PROJECT REPORT

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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT CONTENTS

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In the present scenario, accidents are due to speeding, reckless driving, dogging etc. Many fatal car accidents have occurred due to the speeding of other vehicles. This paper focuses on preventing car collision using Intelligent Braking. The vehicle state information is being equipped with sensors to envisage the possibility of the accident and accordingly reduces the vehicle speed. This methodology reduces the speed of motors and vehicle when the distance is reduced than the safety limit, and these modules are interfaced through a microcontroller. This is in line with present technology in manufacturing smart cars and the desires of individuals who continuously needs to have a contented and secure ride in their vehicles. Moreover, this type of cars can be suitable and are much better into the intelligent highway

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CHAPTER VI

CONCLUDING REMARKS

6.1 Conclusion and Result:

[1] **Intelligent braking system** is the braking system of future. The inter disciplinary interaction of mechanic and electronics provides its greatest benefits –sensors, valves and pneumatic cylinder work together and allow totally novel, highly dynamic brake.

[2] In this system, Sensors unit sense the obstacle which cannot be judge easily by basic human beings. This sensor gives control signal and process of application of brake is done within the few seconds.

[3] The intelligent braking system is useful in avoiding the damage and accidents occurs during the parking of vehicle in parking side specially when driver parking a vehicle from rear side

6.2 Advantage Disadvantage And Application Of System:

6.2.1 Advantage of system:

- [1] Avoid damage and accidents during parking of vehicle.
- [2] Brake cost will be low.
- [3] Less power consumption system
- [4] Free from wear adjustment.
- [5] As the system consists of pneumatic operations, whole system will pollution free.
- [6] Installation is very simple and less costly
- [7] System will open up new ideas and opportunities in automobile industry

6.2.1 Disadvantages of system:

- [1] As the pneumatic parts are quite costly, system will required additional cost.
- [2] If there is fault in working of sensor or control circuit, will create problem in system. So its better way that sensor should be properly installed



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7.	712820114704	RAGHUL DRAVID G
8.	712820114354	VISHNU S
9.	712820114307	ARUN KUMAR M
10.	712820114004	GUNASEKARAN S
11.	712820114320	HARIPRASATH G
12.	712820114702	BOOBALAN R
13.	712821114015	RAKESH M
14.	712821114708	ABIRAJ G
15.	712821114702	SANJITH M
16.	712821114016	SIBIRAJ M
17.	712821106009	BHARATHI S

18.	712821114014	NAGARAJ J
19.	712821114001	ANBU CHEZIYAN R
20.	712821114029	SANJAY T
21.	712821114008	DINESH VISAGAN M
22.	712821114012	JAYA PRAKASH E
23.	712821114004	ARUNKUMAR V
24.	712821114025	SUDHARSAN S

**TAMIL NADU STATE TRANSPORT CORPORATION (TNV) LTD,
NAGERCOIL REGION,**

RANITHOTTAM, NESAMONY NAGAR, NAGERCOIL - 629 001

INPLANT TRAINING CERTIFICATE

No: 2121/A 3/TNSTC/NGL/2003

Dated:12.07.2023

- 1.Name** : **ABINESH. M.J**
- 2.College Details** : **RVS COLLEGE OF
ENGINEERING & TECHNOLOGY
COIMBATORE**
- 3.Period of Training** : **B.E (MECHANICAL) III YEAR
26.06.2023 to 12.07.2023**
- 4.Actual number of working days
during the period excluding
Sunday and Holidays** : **10 Days**
- 5.Nature of Training given** : **Study the Re-conditioning methods
of Engine, Gear Box, F.I.Pump, Front
and Rear Axles, Clutch Assembly,
Steering Box etc.**
- 6.Performance during Inplant
Training** : **GOOD**

M.J. Abin
SIGNATURE OF THE STUDENT



M. J. Abin
DEPUTY MANAGER (PERSONNEL)
T.N.S.T.C. (TNV) LTD, NAGERCOIL REGION

12/7/23



NLC INDIA LIMITED
(“NAVRATNA” – A GOVERNMENT OF INDIA ENTERPRISE)
NEYVELI – 607 801, TAMIL NADU
CERTIFICATE

This is to certify that

SANJAI.V

Studying **BACHELOR OF ENGINEERING** in

MECHANICAL ENGINEERING at

RVS COLLEGE OF ENGINEERING & TECHNOLOGY

has undergone Internship Training on

“STUDY OF CFBC BOILER”

During the period from **10.07.2023** to **22.07.2023** at

TPS-II EXPN, NLC INDIA LIMITED, NEYVELI

DATE: 22.07.2023

PLACE: NEYVELI

for *25/07/2023*
CHIEF MANAGER
LEARNING AND DEVELOPMENT CENTRE
NLC INDIA LIMITED, NEYVELI

Chief Manager
Learning & Development Centre
NLC India Limited, Neyveli-3.

TRAINING ADDING VALUE TO LIFE

REF: MSI/HR/23-24/INT-13

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Jayakumar.R (712820114704)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**



Authorized signature

REF: MSI/HR/23-24/INT-07

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Jayaprakash.G (712820114005)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**



Authorized signature

REF: MSI/HR/23-24/INT-11

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Jeevanandham.N (712820114321)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**



The image shows a handwritten signature in blue ink over a circular stamp. The stamp contains the text 'MECH SOURCE INDIA' around the top and 'CBE' at the bottom, with two stars on either side of 'CBE'.

Authorized signature



MECH SOURCE INDIA
The Source of Engineering

MECH SOURCE INDIA
09-07-2023

REF: MSI/HR/23-24/INT-05

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Mahendhra Kumar.M (712820114006)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**

The stamp is circular with the text "MECHSOURCE INDIA" around the top edge and "CBE" at the bottom, flanked by two stars. A handwritten signature in blue ink is written over the stamp.

Authorized signature

No: 23C, Near ELGI Equipment's Coimbatore.PostalCode-641023
Email Add: mechsourceindia@gmail.com Mobile: +91 9025562946
GST: 33ABQFM6203Q1ZR

REF: MSI/HR/23-24/INT-09

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Raghul Dravid.G (712820114704)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**



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REF: MSI/HR/23-24/INT-12

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Vishnu.S (712820114354)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**



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REF: MSI/HR/23-24/INT-08

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Arunkumar.M (712820114307)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**



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REF: MSI/HR/23-24/INT-06

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Gunasekar.S (712820114004)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**



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REF: MSI/HR/23-24/INT-10

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mr.Hariprasanth (712820114320)** Pursuing **BE (Mech)** Of R.V.S College of Engineering and technology, Coimbatore had under gone internship Training our organization from 03-July-2023 to 08-July-2023.

During this period his character and conduct was found to be good, we wish him all success in future endeavors.

For **MECH SOURCE INDIA**



A handwritten signature in blue ink is written over a circular blue stamp. The stamp contains the text 'MECH SOURCE INDIA' around the top edge and 'CBE' at the bottom, with two small stars on either side.

Authorized signature



ISHA ENTERPRISES

Think Different

42L, Svsn Avenue, Sathy Main Road,
Kavundapadi - Erode (Dt) - 638 455

GSTIN: 33AXGPN5931N1Z3

Cell : 63792 15020, 77089 12489

Date : 13/07/23

CERTIFICATE

FOR INTERNSHIP

THIS CERTIFICATE IS AWARDED TO,
BOOBALAN .R

For Him Outstanding Completion of the internship program at firm ISHA ENTERPRISES For role of MARKETING & COSTING under the guidance. From date 04.07.2023 to 11.07.2023. He is found to be hardworking, sincere and diligent. We wish him all the best for future.

For ISHA ENTERPRISES

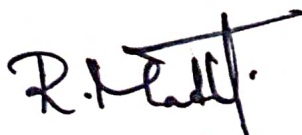

Proprietor

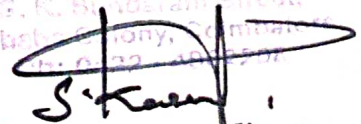


EMGLITZ TECHNOLOGIES

Certificate of Internship Completion

This is to certify that M. RAKESH
from RYS COLLEGE OF ENGIN. & TECHNOLOGY, pursuing
MELHANKA ENGINEERING has successfully
completed the internship in the field of ROBOTICS from
10/07/2023 to 17/07/2023 in our organization.
Throughout the **INTERNSHIP** program with us, He/She had been
exposed to different processes and was found punctual,
hardworking and inquisitive.


Trainer

EMGLITZ TECHNOLOGIES
G. K. Sundaram Street,
Sallekumbhony, Palakkad
Dist. Palakkad, Kerala

Program co-ordinator



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Date: 17.07.2023

MTRF/INTERNSHIP/2023/33

INTERNSHIP CERTIFICATE

This is to certify that **Mr.G.ABIRAJ** (Reg.No: 712821114708), II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.

M. Meignanamoorthy
FOUNDER & CEO

Dr. M. MEIGNANAMOORTHY, M.E., Ph.D.,
FOUNDER & CEO
Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
1-st Cross, PUDUKKOTTAI - 622 001,
Tamil Nadu, India.



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Date: 17.07.2023

MTRF/INTERNSHIP/2023/31

INTERNSHIP CERTIFICATE

This is to certify that **Mr.M.SANJITH** (Reg.No: 712821114702), II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.

M. Meignanamdorthy
FOUNDER & CEO

Dr. M. MEIGNANAMDORTHY, M.E., Ph.D.,
FOUNDER & CEO
Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
1-st Cross, PUDUKKOTTAI - 622 001,
Tamil Nadu, India.



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Date: 17.07.2023

MTRF/INTERNSHIP/2023/23

INTERNSHIP CERTIFICATE

This is to certify that **Mr.M.SIBIRAJ (Reg.No: 712821114016)**, II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.

M. Meignanamdorthy
FOUNDER & CEO

Dr. M. MEIGNANAMDORTHY, M.E., Ph.D.,
FOUNDER & CEO
Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
1-st Cross, PUDUKKOTTAI - 622 001,
Tamil Nadu, India.



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Date: 17.07.2023

MTRF/INTERNSHIP/2023/32

INTERNSHIP CERTIFICATE

This is to certify that **Mr.M.BHARATHI (Reg.No: 712821114703)**, II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.

M. Meignanamoorthy
FOUNDER & CEO

Dr. M. MEIGNANAMOORTHY, M.E., Ph.D.,
FOUNDER & CEO
Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
1-st Cross, PUDUKKOTTAI - 622 001,
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Date: 17.07.2023

MTRF/INTERNSHIP/2023/22

INTERNSHIP CERTIFICATE

This is to certify that **Mr.J.NAGARAJ (Reg.No: 712821114014)**, II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.


FOUNDER & CEO

Dr. M. MEIGNANAMDORTHY, M.E., Ph.D.,
FOUNDER & CEO
Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
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Date: 17.07.2023

MTRF/INTERNSHIP/2023/20

INTERNSHIP CERTIFICATE

This is to certify that **Mr.R.ANBUCHEZHIAN (Reg.No: 712821114001)**, II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.

M. Meignanamoorthy
17/7/23
FOUNDER & CEO

Dr. M. MEIGNANAMOORTHY, M.E., Ph.D.,
FOUNDER & CEO
Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
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Tamil Nadu, India.



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THE PUDUKKOTTAI DISTRICT CO-OPERATIVE MILK
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TIRUKOKARNAM(PO)PUDUKKOTTAI-2, TEL: 04322-220691
GSTIN: 33AAAAT6119Q1Z5

THIRU.S.PALANIYANDI
PRESIDENT

DR.S.NAGARAJAN,B.V.SC
GENERAL MANAGER

REF.NO. 4334/ESTT/2017


DATE: 15.07.2023

CERTIFICATE

TO WHOM SO EVER IT MAY CONCERN

THIS IS TO CERTIFY THAT T.SANJAY, IIND YEAR MECHANICAL
ENGINEERING, RVS COLLEGE OF ENGINEERING AND TECHNOLOGY,
COIMBATORE HAS UNDERGONE INTERNSHIP TRAINING IN OUR DAIRY FROM
07.07.2023 TO 14.07.2023.

FOR PUDUKKOTTAI DIST. CO-OP
MILK PRODS' UNION LTD.,
(SD) S.NAGARAJAN
GENERAL MANAGER


15/7/2023
FOR GENERAL MANAGER
MM. 296, PUDUKKOTTAI DISTRICT
CO-OP MILK PRODUCERS UNION LTD.
KALYANARAMAPURAM 1-ST STREET
TIRUKOKARNAM, PUDUKKOTTAI - 2

COPY TO:

T.SANJAY, IIND YEAR MECHANICAL ENGINEERING



MECK TECK RESEARCH FOUNDATION

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Date: 17.07.2023

MTRF/INTERNSHIP/2023/30

INTERNSHIP CERTIFICATE

This is to certify that **Mr.M.DINESH VISAGAN** (Reg.No: 712821114008), II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.

M. Meignanamorthy
FOUNDER & CEO

Dr. M. MEIGNANAMOORTHY, M.E., Ph.D.,
FOUNDER & CEO
Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
1-st Cross, PUDUKKOTTAI - 622 001,
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NLC INDIA LIMITED

(“NAVARATNA”- A GOVERNMENT OF INDIA ENTERPRISE)

NEYVELI-607 801, TAMIL NADU

CERTIFICATE

This is to certify that

JAYAPRAKASH E

Studying **Bachelor of Engineering in Mechanical** at

RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE

has undergone Internship Training on

MAINTENANCE PRACTICES IN MAIN TURBINE AND ITS AUXILIARIES

during the period from **10.07.2023** to **22.07.2023** at

THERMAL POWER STATION -II

NLC INDIA LIMITED, NEYVELI

22.07.2023

NEYVELI

CHIEF MANAGER

LEARNING AND DEVELOPMENT CENTRE

NLC INDIA LIMITED
Chief Manager
Learning & Development Centre
NLC India Limited, Neyveli-3.

Training adding Value to life



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Date: 17.07.2023

MTRF/INTERNSHIP/2023/21

INTERNSHIP CERTIFICATE

This is to certify that **Mr.V.ARUNKUMAR** (Reg.No: 712821114004), II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.

H. Meignanamoorthy 17/7/23

FOUNDER & CEO

Dr. M. MEIGNANAMOORTHY, M.E., Ph.D.,
FOUNDER & CEO

Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
1-st Cross, PUDUKKOTTAI - 622 001,
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MECK TECK RESEARCH FOUNDATION

(Registered Under Ministry of Micro, Small and Medium Enterprises UDYAM-TN-17-0015761)

Date: 17.07.2023

MTRF/INTERNSHIP/2023/29

INTERNSHIP CERTIFICATE

This is to certify that Mr.S.SUDHARSAN (Reg.No: 712821114025), II Year B.E. Mechanical Engineering student of RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE has undergone internship at our R&D (Research & Development) Unit from 30.06.2023 to 15.07.2023 (Two Weeks) and during the internship period his performance found satisfactory.


FOUNDER & CEO

Dr. M. MEIGNANAMDORTHY, M.E., Ph.D.,
FOUNDER & CEO
Meck Teck Research Foundation
6/9, Kamarajapuram 17-th Street,
1-st Cross, PUDUKKOTTAI - 622 001,
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