Basavarajeshwari Group of Institutions

SANJAY GANDHI POLYTECHNIC, BALLARI





YANTHRIKA

Mechanical Engineering News Letter



DEPARTMENT OF MECHANICAL ENGINEERING



To create globally competent and skilled Mechanical Engineers with sound technical knowledge, innovativeness and social responsibilities.

1. To impart quality technical education to students by providing excellent teaching & learning Environment in collaboration with the industry.



- **2** . To encourage ethical values and leadership abilities in the minds of students so as to work towards the growth of the society.
- 3. Provide industry oriented practical experience and skills necessary for innovativeness, employability, entrepreneurship and global competency.

DEPARTMENT STRUCTURE



Vice Principal/Head of the Department

Mr. GOURISHANKAR H M B.E, M.Tech.MISTE, ISHRAE

It gives me immense pleasure to see our "Yanthrika" a
News Letter of Mechanical department being put
together at best of its heights. Envisioned as a
platform to showcase students' talent, departmental
activities. It has taken huge effort to make it possible.
I wish the best for the Staff and students who have
worked to make it possible and successful. Here by all
the students who are using this platform to spread

word of their talents of this academic, I hope you all will continue doing so and reach greater heights of the department and as well as the college.

Teaching Staffs

Technical Staffs

- 1. Mr.Nagaraj B Hugar
- 2. Smt.Nandhini V R
- 3. Smt. Vardhini C
- 4. Mr.Syed Assad Basha
- 5. Mr.Raghu Y V
- 6. Smt. Taluri Dhanalaxmi
- 7. Mr. Mohammed Ali L V
- 8. Ms.John sapna
- 9. Mr.Siddaruda K
- 10. Mr. Mohan raj V H
- 11. Mr.B D N prasasd
- 12. Mr.Maharaj gowda
- 13. Mr.Ramanjneyalu K
- 14. Ms.Asha B M
- 15. Mr. Venkat Harish S
- 16. Mr. Amaresh U
- 17. Mr.Basavaraj G
- 18. Mr. Venkatesh K
- 19. Mr.Ramanjineyulu B
- 20. Mr.Daangi Eranna
- 21. Mr.Sandeep S
- 22. Smt. Anupama
- 23. Mr.Ravishekar gouda M P
- 24. Mr.Nagarjuna C V
- 25. Ms. Shylaja R

- 1. Mr.Praveen Kumar M
- 2. Mr. Veeraiah Swamy S M
- 3. Mr.Kishore Kumar C
- 4. Mr.K Ramesh Goud
- 5. Mr.Muralidhara B V
- 6. Mr.Rajesh P N
- 7. Mr.R Manjunath
- 8. Mr. Hebry Sunny K
- 9. Mr.Huliganna
- 10. Mr.Basavarj
- 11. Ms.Jayashree
- 12. Smt. Vidhya G T
- 13. Mr. Channa Veeraiah Swamy
- 14. Izar Ahmed

"Engineering stimulates the mind. Kids get bored easily. They have got to get out and get their hands dirty; make things, dismantle things, fix things. When the schools can offer that, you'll have an engineer for life."

PARENT 'S MEET





It's a great day for every student and their parents to be in a part of the "Parent Meet" function at beginning of the college. Even parallel to the management and were happy to receive our upcoming engineers of the academic.

TRAINING PROGRAM





A resource person Dr.V.Venkata Ramana and Asst. Prof. H M Anil Kumar are from BITM, Ballari. Its three days training to our students regarding the Flexible Manufacturing System and its controlling by using automation system. Where, it is a kind of automation in a manufacturing sector. Here by our students emerged with good skills of automation and choose appropriate programming methods with virtual, simulated, mentoring, on the job training, professional development classes, etc.

GUEST LECTURER

Mr. Shambulinga Swamy, Asst. Executive Engineer (M), BTPS, KPCL, Kudathini, Ballari Guest lectures on "Steam Boilers" are being organized by the department of Mechanical Engineering to upgrade the knowledge and skills for Students and Faculties. This bridges the gap between industry and institution.



One day seminar on steam boilers held on 9th September 2018 in Sanjay Gandhi Polytechnic Bellary by Shambulinga Swamy Asst. Executive Engineer (M)KPCL, BTPS, Kudathini, Ballari.

PERSONALITY DEVELOPMENT



Mr. HGF Gourishankar H M and Mr. HGF Devendra B took a seminar on 16th sept 2018 and enlightened students regarding Leadership, Team building and Human relations [LTH] that need to be inculcated by students in organisation which makes them

more adaptable along with integrity that has to be imbibed by students to be successful.

INDUSTRIAL VISIT

Final year students made a three day trip to BTPS, Kudatini as part of industrial visit from 1st to 4th oct 2018 and learnt about practical aspects and various processes in industry which enhanced their knowledge and made them acquainted to industrial lifestyle.



ENTREPRENEURSHIP DEVELOPMENT PROGRAM





A one day workshop on Entrepreneurship Development was organized for final year DME students on 8th Feb 2019. The program was organized by **Entrepreneurship Development Cell** in association with Amith Enterprises, Bellary. The workshop was delivered by Mr. Amith G A, Proprietor of **Amith Enterprises** about **Cot Manufacturing** which would help the students to take up self-employment after completing their education.

PROJECT EXHIBITION

Final year students of 2018-19 batch showcased their projects by demonstrating the projects to the rest of college on 2nd Apr 2019



Swachch Barath Abhiyan



"Cleanliness is next to Godliness" motto was imbibed in students through conduction of SWACHCH BHARATH campaign by Staff/Students who participated in cleaning program of Sanjay Gandhi Nagar Park on 10-08-2018.

YANTHRIKA - 2019 DME



STUDENTS ACHIEVEMENT

CHETHAN G M & SHEERSHAIL

Students are participated in Technical

Workshop "SAN- TECHMANTRA - 2018" has won second prize in the event of Paper presentation on Machining on Lathe it was held at Sandur Polytechnic, Yashwanth nagar.



State level Technical Project Exhibition





- PDIT Engineering College, Hospet had organized state level Technical Project Exhibition "INNOVISION-2019" on 3rd April 2019.
- Total 106 projects were participated in the fest.
- Final year students of DME 2018-2019 batch won First prize for the project titled "DESIGN & FABRICATION OF SOLAR & PETROL POWERED HYBRID CAR".



ಕೈಯಿಂದ ಚಲಿಸುವ ರುಬ್ಬವ ಬಂತ್ರ ಬಳ್ಳಾರಿ ನಾಲಿಟಿಕ್ಕಳನ ಗಣೀನ ಮತ್ತು ತಂಡ, ಒಂದನೆ ಆಧರಿಸಿ ವಸ್ತುಗಳನ್ನು ಎತ್ತಿಡುವ ರೊಬೋಟ್ - ಬಳ್ಳಾರಿ ಆರ್.ವೈ.ಎಂ.ಇ.ಸಿಯ ಉಮೇಶ ಮತ್ತು ತಂಡ, ಒಳಚರಂಡಿ ವೀರಿನ ಸಂಸ್ಕರಣೆ ಮತ್ತು ವಿದ್ಯುತ್ ಉತ್ಪಾದನೆ ದಾವಣಗೆರೆ ಜಿ.ಎಂ.ಮ.ಟ.ಯ

2005089

ಸರುಗುಪ

ತಂಡ, ಅಡಚಿಕೆ ಗ್ರಹಿಸುವ

ತಂಡ, ಅಂತರ್ಜಲದ ಎಲೆಕ್ಟ್ರೋಲೈಟ್ ಫೋರೈಡೀಕರಣ - ಮುಧೋಳ ಬಿ.ಜಿ. ಎಂ.ಎ.ಟಿ.ಮ ಸುಮಾ ಎಸ್. ಜಾಧವ ಮತ್ತು ತಂಡ ಹಾಗೂ ಸಾಚಿಯಿಂದ ಬೆಂಗಳೂರಿನ ನರ್ಮಿನ ಮತ್ತು ತಂಡ ಸಮಾಧಾನಕರ ಬಹುಮಾನೆ ಗಳಿಸಿದೆ.

ಪ್ರಾಚಕ್ಕ್ ಸ್ಕರ್ದೆಯ ನಿರ್ಣಾಯಕರಾ ಬೆಂಗಳೂರಿನ ಕೇಂದ್ರಿಜ್ ತಾಂತಿ societa alecterna, etc. ಪೋಲ್ಡ್ ಸ್ಟೇಶ್ ಸಂಸ್ಥೆಯ ಎ.ಆಕ್ಷ್ಮಣಾ ಭಾಗವಹಿಸಿದ್ದರು. ಕಾಲೇಜಿನ ಆಡಳಿ ಮಂಡಳಿ ಅಧ್ಯಕ್ಷ ಚಾನೇಕುಂ ಮಂಡಳಿ ಅಧ್ಯಕ್ಷ ಜಾನೇಕು ಜಸವರಾಜ, ಗೋನಾಳ್ ರಾಜಕೆಟ ಗೌಡ, ಪ್ರಾಂಕಾಪಾಲಎಸ್.ಎಂ.ಕಕೆದ ಕಾರ್ಯಕ್ರಮ ಸಂಯೋಜಕ ಮದ



್ಷಚ: ನಗರದ ನಿರ್ವಹಿಸಿದ್ದಾರೆ. ನಗರದ ನಿರ್ವಹಿಸಿದ್ದಾರೆ. ನಗರದ ನಿರ್ವಹಿಸಿದ್ದಾರೆ. ನಿರ್ವಹಿಸಿದ್ದಾರೆ.

ಸಲದಿಂದ ಆಲೂಗಡ್ಡ ತೆಗೆಯುವ ಯಂತ ಲಕ್ಷ್ಮೀಕಾಂತ ಮತ್ತು ತಂಡ, ಪಿ.ಡಿ.ವಿ.ಟಿ. ಹೊಸಪೇಟೆ ಬರುಗಿದ ಮಾಕಾಂತ್ರು ಸಮಾರಂಭ'ದ ಅಧ್ಯಕ್ಷತೆಯನ್ನು ವಿಕ್ಕಾವಿ. ಸಂಘದ ಅಧ್ಯಕ್ಷತೆಯನ್ನು ವಿಕ್ಕಾವಿ. ಸಂಘದ ಅಧ್ಯಕ್ಷತೆಯನ್ನು ವಿಕ್ಕಾವಿ. ಸಂಘದ ಪಡಿಸಿದ್ದರು. ಮುಖ್ಯ ಅತಿದಿಗಳಾಗಿ ಹಾಗೂ ಪ್ರಾಜೆಕ್ಟ್ ಸ್ಪರ್ಧೆಯನ್ನು ನೀರ್ಣಾ

ಪಶಿಧರ್ ಕಾರ್ಯ ಕ್ರಮ ಸಂಭೂ ಚಿತ್ರ ಮರ್ಥ್ಯರಾಜ. ಅಲ್ಲೂರ ಬಳಲು ಪ್ರತ್ಯೆ ವೇಧಿಕೆಂಬ್ ಉಪ ಸ್ಥಿತ್ ಶಿವ್ಯ ಪ್ರವಿ ಸಾವಿರ ರೂಪ ಯಾಗು. ಪ್ರತಿ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯೆ ಪ್ರತ್ಯ ಪ್ರಕ್ಷ ಪ್ರಕ್ಷ ಪ್ರತ್ಯೆ ಪ್ರಕ್ಷ ಪ್ರತ್ಯ ಪ್ರತ್ಯೆ ಪ್ರಕ್ಷ ಪ್ರತ್ಯ ಪ್ರತ

State level Technical Project Exhibition "INNOVISION-2019" held on 3rd April 2019 Published in Prajavani & Belagaayitu paper on 5th April 2019 (I Prize)



(100) 100) MARKS					
ENGINEERING MATH	EMATICS - I (15SC01M)				
459ME18189	SAGAR KUMAR B				
459ME18197	SANDEEP G				
459ME18811	SHIVAPRAKASHA GOUDA				

Academic Toppers							
SEM	Reg. No.	Student Name	Marks	Class	Result (%)		
Ţ	459ME18184	S M ASIF	573	Distinction	88.15		
1	459ME18098	M PAWAN	563	Distinction	86.62		
111	459ME17074	K M MOHAMMED AKRAM	661	Distinction	91.17		
459ME17199		SHETTY LOKESH GOPIKRISHNA	659	Distinction	90.90		
V	459ME16045	GANESH C	656	Distinction	87.47		
V	459ME16046 GANESH H		645	Distinction	86		



/	100						
100 MARKS							
ENGINEER	ENGINEERING MATHEMATICS - II (15SC02M)						
459ME18023	B MALLIKARJUNA	459ME18087	KARTHIK K				
459ME18060	GIRISHA S	459ME18098	M PAWAN				
459ME18067	H PRAKASH REDDY	459ME18184	S M ASIF				
459ME18083	KAMAL CHAND						
	BASIC ELEC	TRICAL &					
APPLIED SCIENCE	(15SC03S)	ELECTR	ONICS				
		ENGINEERIN	G (15EE01E)				
459ME18006	AJITH KUMAR A	459ME18184	S M ASIF				
459ME18083	KAMAL CHAND	437ME10104	S W ASIF				
459ME18098	M PAWAN	459ME18197	CANDEEDC				
459ME18165	RADHAKRISHNA P	457ME10197	SANDEEP G				

Academic Toppers							
SEM	Reg. No.	Student Name	Marks	Class	Result (%)		
II	459ME18098	M PAWAN	628	Distinction	96.62		
11	459ME18184	S M ASIF	617	Distinction	94.92		
	459ME17126	MOHIT SONI	657	Distinction	90.62		
IV	459ME17199	SHETTY LOKESH GOPIKRISHNA	654	Distinction	90.21		
VI	459ME16800	YAMBA VIKAS	536	Distinction	85.76		
VI	459ME17308	HONNURASWAMY H	531	Distinction	84.96		

GANESH C 459ME16045						
I SEM	II SEM	III SEM	IV SEM	V SEM	VI SEM	84.9%
79.69 %	86.15%	83.31%	87.45%	87.47%	84.8%	01.5 /0

			NKATES 9ME161			
I SEM	II SEM	III SEM	IV SEM	V SEM	VI SEM	83.49%
87.69%	84.77%	86.48%	85.24%	78.93%	77.76%	33.13 / 0

Mr. Madhusudhan Rao honouring the topper of 2017-18 batch, SHETTY LOKESH GOPIKRISHNA (459ME17199) by presenting him with a memento on 14th Sep 2018



SPORTS



Along with studies a student who outcome with his great efforts in Sports, That is our Mr. M S Mansoor, 1st year Mechanical Student, He won events like long jump with 2nd Place and Medley

relay (4X100mts) with 1st place at 34th Karnataka state Junior & Senior Athletic championship – 2018 (3rd Sept to 5th Sept) which was held at Moodbidri DK. His performance made our college pride and happy.





GRADUATION DAY

It's a great privilege to us that our college celebrated Graduation Day at BITM on 24th March 2019. This Graduation may look a little different this year, with Lecturers and



friends will gather for a Regardless, graduation will always be a time to celebrate your favourite student's accomplishments and the exciting things that lay ahead in their futures. As a student or close friend of the lecturer, you've already done your job of shaping their mind and filling their heart. Now it's time to take a step back and let them shine. If this exciting time has you at a loss for words, here are over one hundred graduation quotes that will help you share wisdom and knowledge.





Awarding 2018-19 Batch Toppers

2018-2019 BATCH STUDENTS









Management and Staffs members were happy to convey great thanks to those companies who haired our students for your company. Today the global employment market has changed from what it was even a decade ago. Organizations are not only looking for individuals with a prescribed skill set but more importantly individuals with an aptitude to expand this required skill set in the course of their work.

An aptitude testing has become an inherent part of all recruitment processes and hence aptitude skills are imperative for the career.

Sl. No.	Name of Company	No. of Students Placed
1	JSW Steel Ltd.	7
2	Toyota Kirloskar Motor Pvt, Ltd,	1
3	Triveni Turbine Ltd.	1
4	Rane madras Pvt. Ltd.	5
5	CEAT Tyres Ltd.	1
6	Kirloskar Ferrous industries Ltd	2
7	Anand Groups	1
8	TOYODA GOSEI South India Pvt Ltd	10

28 students got placed through campus interview and 14 students were placed off campus, total 42 students got placed and fulfilled their dream of working for multinational companies.



































"It's time to start living the life we've imagined"



TECHNICAL PAPER



DESIGN AND FABRICATION OF SOLAR AND PETROL POWERED HYBRID CAR

¹Amaresh U ²B D N Prasad ³Ganesh C ⁴Mohammed Shuaib Ali ^{1,2} Lecturers ^{3,4} Students

^{1,2,3,4} Dept. of Mechanical Engineering, Sanjay Gandhi Polytechnic, Ballari, Karnataka, India.

Abstract: Today's Automobile world is moving very fast towards manufacturing of hybrid cars. A hybrid car not only depends on the batteries but also on internal combustion engine. This method is used to optimize and fuel consumption of the hybrid electric car. Hybrid car have great potential in lowering emissions and reducing fuel demand as the ever growing problems of air pollution and global warming reached its critical stages.

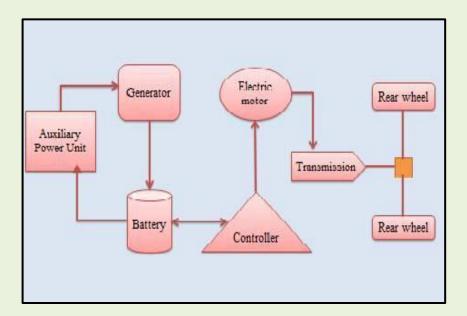
Keywords: Solar panel, Battery, IC engine, Chassis, Dynamo and Motor.

I. INTRODUCTION

A hybrid vehicle uses two or more distinct types of power, such as internal combustion engine to drive an electric generator that powers an electric motor e.g. in diesel-electric trains using diesel engines to drive an electric generator that powers an electric motor, and submarines that use diesels when surfaced and batteries when submerged. Other means to store energy include pressurized fluid in hydraulic hybrids. The basic principle with hybrid vehicles is that the different motors work better at different speeds; the electric motor is more efficient at producing torque, or turning power, and the combustion engine is better for maintaining high speed (better than typical electric motor). Switch from one to the other at the proper time while speeding up yields a win-win in terms of energy efficiency. Mopeds, electric bicycles, and even electric kick scooters are a simple form of a hybrid, powered by an internal combustion engine or electric motor and the rider's muscles.

Hybrid vehicle is a combination of a conventional internal combustion engine and an electric propulsion system. It implies that it can be driven on I.C. engine as well as on electric power. It produces less emission compared to a similar-sized gasoline car as the gasoline engine of the It can be geared to run at maximum efficiency. The significance of electric power train is that it runs with lesser power loss, hence improving the overall fuel economy. Hybridization of vehicles can reduce CO₂ emission and also the fuel costs. At present, hybrid electric vehicles are widely available in commercial vehicles, military vehicles and passenger cars.

II. METHODOLOGY



III. COMPONENTS OF HYBRID CAR

In a hybrid car, there are mainly nine parts. They are:-

- Chassis
- **Engine**
- **Transmission**
- > Tyres
- Steering
- Brake
- Electric Starter
- Solar panel
- Electric dc slow motor

1. Chassis

A chassis is the framework of an artificial object, which supports the object in its construction and use. An example of a chassis is a vehicle frame, the under part of a motor vehicle, on which the body is mounted; if the running gear such as wheels and transmission, and sometimes even the driver's seat, are included, then the assembly is described as a rolling chassis.

In the case of vehicles, the term rolling chassis means the frame plus the "running gear" like engine, transmission, drive shaft, differential, and suspension. An armoured fighting vehicles hull serves as the chassis and comprises the bottom part of the AFV that includes the tracks, engine, driver's seat, and crew compartment. This describes the lower hull, although common usage might include the upper hull to mean the AFV without the turret. The hull serves as a basis for platforms on tanks, armoured personnel carriers, combat engineering vehicles, etc.

2. Engine

An engine of a hybrid car is generally a small one about 125cc in this car we use a SUZUKI ACCESS single cylinder 125cc 4-stroke petrol engine, which produces about 8.7 BHP @ 7000Rpm. We used 4-stroke because this is eco friendly then two stroke engine.

Sl. No	Name	Specification
1	Engine	Four-stroke/petrol
2	Transmission	Automatic
3	Engine displacement	125cc
4	Max power	8.7bhp@7000rpm
5	Max torque	10n-m@5000rpm
6	Ignition	Electronic
7	Battery	12v

Table 1: Technical Specification of Suzuki Access 125cc Engine

3. Transmission System

A transmission is a machine in a power transmission system, which provides controlled application of the power. Often the term transmission refers simply to the gearbox that uses gears and gear trains to provide speed and torque conversions from a rotating power source to another device.

4. Tyres

For Hybrid car, wheels and tyres are much smaller than those used on a normal car. The tyres will have increased grip and a hard one. And also it can withstand the high temperature. In hybrid car, we use tyres 15" dia for front and for rear. This is used for an aerodynamic shape. The tyres must have pressure of at least 18 psi.

5. Disc Brake

A disc brake is a type of brake that uses calipers to squeeze pairs of pads against a disc or "rotor"[1] to create friction. This action slows the rotation of a shaft, such as a vehicle axle, either to reduce its rotational speed or to hold it stationary. The energy of motion is converted into waste heat which must be dispersed. Hydraulically actuated disc brakes are the most commonly used form of brake for motor vehicles, but the principles of a disc brake are applicable to almost any rotating shaft.

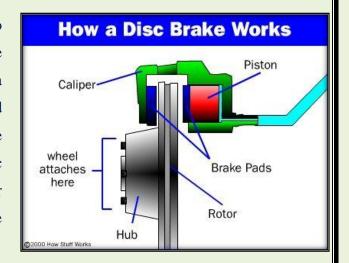


Figure 1: Disc Brake

6. Electric Starter

A starter (also self-starter, cranking motor, or starter motor) is a device used to rotate (crank) an internal-combustion engine so as to initiate the engine's operation under its own power. Starters can be electric, pneumatic, or hydraulic. In the case of very large engines, the starter can even be another internal-combustion engine.

Internal-combustion engines are feedback systems, which, once started, rely on the inertia from each cycle to initiate the next cycle. In a four-stroke engine, the third stroke releases energy from the fuel, powering the fourth (exhaust) stroke and also the first two (intake, compression) strokes of the next cycle, as well as powering the engine's external load. To start the first cycle at the beginning of any particular session, the first two strokes must be powered in some other way than from the engine itself. The starter motor is used for this purpose and is not required once the engine starts running and its feedback loop becomes self-sustaining.

7. Solar Panel

Photovoltaic solar panels absorb sunlight as a source of energy to generate electricity. A photovoltaic (PV) module is a packaged, connected assembly of typically 6x10 photovoltaic solar cells. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications.



Figure 2: Solar Panel

Table 2: Solar Panel Specifications

Sl. No.	Name	Specification
1.	Power (P _{max})	310 W
2.	Open circuit voltage	44.90 voc
3.	Short circuit current	8.52 Isc
4.	Voltage at maximum	36.40 Vpm
5.	Maximum over current protective	20 A
6.	Weight	22 kgs
7.	Size (L*W*H)	1970*990*35 mm

Solar Panel Calculation:

$$I = \frac{P}{V} = \frac{310}{36} = 8.5 \text{ amps}$$

8. Electric DC Slow motor

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronics, to periodically change the direction of current flow in part of the motor. DC motors were the first form of motor widely used, as they could be powered from existing direct-current lighting power distribution systems.

A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances.



Figure 3: Electric DC motor

Table 3: DC Slow Motor Specifications

SL.NO	Name	Specification
1.	Туре	BLDC
2.	ID	C800W SR.NO.
3.	RPM	3000

DC Slow motor Calculation:

$$I = \frac{P}{V} = \frac{800}{48} = 16 \text{ amps}$$

IV. SPECIFICATIONS OF HYBRID CAR

1. Design of Chassis:

Type of Material = Rectangular Tube (MS)

2. Axle:

Type of Material = MS

Length of Axle = 120cm & Diameter of Axle =

25.59cm

3. Brake:

Position = Single Rear

Type = Disc Brake

Brake Diameter = 259cm

4. Sprocket:

Type of Material = M S

Outer Diameter of Sprocket = 163mm

No. Of Teeth = 39

5. Fuel Tank:

Material = Sheet Metal (Galvanized Steel)

Capacity = 3.75 Litters

6. Steering Spindle:

Diameter of Tube = 18mm

Material = Galvanized Iron Tube

7. Pedal:

Type of Material = MS

8. Muffler:

Material = Aluminium

Greater Diameter of Muffler = 63.45mm

Total Length = 50cm

Smaller Diameter of Muffler = 25.43mm

Table 4: Specifications of hybrid car

Sl. No.	Name	Specification
1.	Engine Displacement	125cc
2.	No. of Cylinders	1
3.	Type of Fuel	Petrol and Solar
4.	No. of Strokes	4
5.	Maximum Power	8.7bhp@7000rpm
6.	No. of Gears / Variator	Variator
7.	Overall Length	200cm
8.	Height	100cm
9.	Wheel Base	900mm
10.	Ground Clearance	24cm
11.	Kerb Weight	4.43kg
12.	Fuel Tank Capacity	3.75lts
13.	Brake	Drum and Disc
14.	Type of Cooling	Air Cooling
15.	Solar panel	310w
16.	Slow DC motor	3000rpm

V. WORKING

The working principle of this car basically involves two processes, the first process involves when the vehicle is running by means of internal combustion engine and the second process involves when the vehicle is running by means of an solar energy. When the vehicle is driven at the outside of city the vehicle is powered by means of internal combustion engines. The power from the engine is taken and is transmitted to the wheels with the help of the sprocket and the chain drive and then it rotates the wheel.

At critical situations or when the fuel runs out, the vehicle is powered by means of a motor. The power to run the motor is supplied from the battery. During this process the speed of the vehicle will be minimum and there is no smog forming pollutants produced during the vehicle runs. When the vehicle is powered by means of solar DC slow motor the power from the internal combustion engine will be disconnected from the shaft by loosening the belt. The mileage of the vehicle while running on the electric motor is mainly depends upon the time of charging and also depends upon the capacity of the battery. In this process the motor cum generator serves as motor as well as generator. It serves as a motor when the vehicle is running by means of battery and it serves as a generator when the vehicle is running by means of internal combustion engine.







Figure 4: Various views of Hybrid Car

Advantages

- [1] Simple in construction.
- [2] Easy to fabricate
- [3] The components involved in the fabrication are simple and are easily available.
- [4] This car helps at times when there is low or no fuel.
- [5] The dependency on the fossil fuels all the time may be avoided.
- [6] Fuels can be saved for the future generations.
- [7] The pollutions are reduced to a considerable amount since the vehicle runs by engine at times only.

Disadvantages

- [1] More number of moving parts.
- [2] Need skilled operators to repair and replace this car.
- [3] Only low loads are bearable when the car is in battery operated mode.

Applications

These types of hybrid cars have a wide range of applications in the fields like,

- [1] All automobile industries,
- [2] Highly suitable for four wheelers.
- [3] Light vehicles.
- [4] Electric cars.

VI. 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 the institution and the industries. We are proud that we have completed the work with the limited time successfully.

The **DESIGN AND FABRICATION OF OLAR AND PETROL POWERED HYBRID CAR** is working with satisfactory conditions. We can able to understand the difficulties in maintaining the tolerances and also the quality. We have done to our ability and skill making maximum use of available facilities.

When entire world is facing the scarcity of petrol prices are so high in cost. Hybrid car have come up as a promising and a feasible option to cope with the situation.

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"Manufacturing is more than just putting parts together. It's coming up with ideas, testing principles and perfecting the engineering as well as final assembly."

HYDRAULIC FLOOR CRANE

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ABSTRACT

Cranes do play the most vital role in the manufacturing industries. In this project we aim to create a machine that reduces man power. This project deals with fabrication of Hydraulic Floor crane. The aim of this project work is to acquire practical knowledge in the field of material handling equipment with the help of hydraulic principle. This machine is very useful for lifting and transporting heavy jobs up to ITONNE for all types of jobs such as automobile repairs and service shops of central workshops, production industries, and material industries. In our project we aim to fabricate a hydraulic operated floor crane for handling various kinds of materials. Thus the floor crane would serve as a safe and versatile model for material handling.

Keywords: - Hydraulic Floor Crane

1. INTRODUCTION

A crane is a type of machine generally equipped with a hoist rope, wire ropes or chains, and sheaves that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to their places. The device uses one or more simple machines to create mechanical advantage and thus move loads beyond the normal capability of a human. Cranes are commonly employed in the transport industry for the loading and unloading of freight in the construction industry for the movement of materials and in the manufacturing industry for the assembling of heavy equipment.

A solenoid valve is an electromechanically operated valve .[1] The valve is controlled by an electric current through a solenoid; in the case of a two-part valve the flow is switched on or off; in the case of a three-port valve, the out flows switched between the two outlet ports. Multiple solenoid valves can be placed two gather on a manifold.[2] solenoid valves are the most frequently used control elements in fluidics their tasks are to shut off, release dose ,distribute or mix fluids. They are found in many application areas solenoids offer and safe switching, high reliability, long service life, good medium compatibility of the materials used ,low control power and compact design.[3]

A **hydraulic cylinder** (also called a linear hydraulic motor) is a mechanical actuator that is used to give a unidirectional force through unidirectional stroke. It has much application, notably in construction equipment (engineering), manufacturing machinery, and civil engineering [4-9].

A **rotary vane pump** is a positive displacement pump that construct of vales mounted to a rotor that rotates inside of a cavity. [10]in some cases ,this vales can have variable length and /or be tensioned to maintained contact with the vales as they pumps rotates.[11]

The arm supports the load carried by the crane setup, it should be designed with proper arrangement [12] that it should be rigidly fixed with the base frame at its one end and its other end is connected with the effectors for performing the operations say load lifting.[14]In order to carry heavy loads there are several kinds of design optimization which is need for designing and manufacturing the efficient model of arm for heavy load carrying purposes. The cross link members are used for providing additional supports to the frame by reducing its actual weights and also by increasing its overall stability.[13]

A **frame** is basic structure designed to bear a load in a light weight economical manner. The simplest form of an A-frame is two similarly sized beams, arranged in a 45- degree or less angle, attached at the top. This materials are often wooden or steel beams attached at the top by rope, welding, gluing or riveting.[14]

Because they have only two "legs", frames are usually setup in rows so that they can have good stability.[15]A saw horse is a good example of these structure. More complex structures will have a cross member connecting the two materials in the middle to prevent the legs from bowing outwards under load.[16]

A **wheel** is a circular component that is intended to rotate on an axle bearing. The wheel is one of the main components of the wheel and axle which is one of the six simple machines.[17] wheels ,in conjunction with axles, allow heavy objects to be moved easily facilitating movement or transportation while supporting a load, or performing labor in machines. Wheel is also used for other purposes, such as a ship's wheel, steering wheel, potter's wheels and fly wheel [18].

A **hydraulic cylinder** is the actuator or "motor" side of the system. The "generator "side of the hydraulic system is the hydraulic pump which brings in a fixed or regulated flow of oil to the hydraulic cylinder to move the piston. The piston pushes the oil to in the other chamber back to the reservoir.[19]

Hydraulic cylinder gets their power from pressurized hydraulic fluid, which is typically oil. The hydraulic cylinder consists of a cylinder barrel, in which a piston connected to a piston rod moves back and forth.[20]

2. METHODOLOGY

2.1 WORKING PRINCIPLE OF HYDRAULIC FLOOR CRANE

Hydraulic cylinders get their power from pressurized fluid, which is typically oil. The hydraulic cylinder consist of a cylinder barrel, in which piston connected to a piston rod moves back and forth. The barrel is closed on one end by the cylinder bottom (also called the cap) and the other end by the cylinder head (also called the gland) where the piston rod comes out of the cylinder.

The piston has sliding rings and seals. The piston divides the inside of the cylinder in to two chambers, the bottom chamber (cap end) and the piston rod side chamber. Hydraulic cranes work on the concept of transmitting forces from one point to another through a fluid and only due to this they are able to lift the heavy loads. In the essence, a hydraulic crane works on optimizing the strength that is produced by the liquid under pressure. Generally the liquid is oil that works with the system of pistons. These pistons are attached to the system of levers and thereby used to lift heavy loads.





Figure 1: Assembly of Hydraulic Floor Crane

Figure 2: Operation of Hydraulic Floor Crane

2.2 SPECIFICATIONS

1. Outside diameter of cylinder	76mm
2. Piston rod diameter of cylinder	30mm
3. Cylinder stroke	450mm
4. Hydraulic lift per stroke	20mm
5. Hydraulic jack capacity	1ton
6. Outer boom cross-section area	$L*B*T = 60*60*5 = 104mm^2$
7. Inner boom cross-section area	$L*B*T = 49*40*7 = 92mm^2$
8. Vertical support	140mm
9. Legs cross-section area	$L*B*T = 50*50*3 = 118mm^2$
10. Support	108mm

Table 1: Specifications

2.3 APPLICATIONS

Used for loading lifting, caring and shifting operations in small, medium and large industries like,

- Foundry
- Welding Workshops
- Automobile Workshops
- Constructions Sites, etc....

2.4 MERITS

Most Powerful Means Of Lifting Objects:

It is one of the most powerful means of lifting objects is with the strength of a hydraulic crane. By harnessing the strength that liquid under pressure gives ,and the ease with which it can be used, it is possible to transfer a relatively small amount of efforts from one place to another, and hydraulic cranes are amongst the most efficient lifting systems available in the modern workplace.

Extremely Stable In Use:

Because the hydraulic cranes use a fixed system of pipes constant pressure can be maintained once a part of the system has been moved into a place, and this makes the extremely stable in use, and able to support relatively large weights.

very easy to maintain:

Hydraulic cranes are amongst the simplest systems that it can use within any industrial process, and are very easy to maintain. Provided that all the pumps and pistons are regularly checked for any leaks, and potential stress point where the levers are supported are inspected for damage, the crane will continue to operate completely reliably for long periods of time.

Avery versatile tool:

Most hydraulic cranes are comparatively light weight, and the ease with which they can be moved from one area to another within the factory or distribution center, makes them a very versatile tool with lots of uses on a day to day basis. From simple loading jobs in your loading bay area where the portable hydraulic cranes can be used to lift objects into a waiting truck to more complex jobs within the main factory, the lifts will come in very useful.

• Quite Simple Design:

A hydraulic system works with a system of pumps and piston that is filled with a liquid, usually a light oil or water. By moving the liquid under pressure from the pumps, pistons can be extended or reduced, and when these pistons are connected to a system of levers, the pistons can be used to lift surprisingly heavy weights.

Ability to lift in small spaces:

They are relatively small pieces of lifting equipment and can therefore perform tasks where other lifting mediums would be unable to.

Good for specific tasks:

As well as the ability to use these cranes in small spaces, they are also extremely useful in carrying out specific tasks, such as taking out or fitting car engines, and unloading loads off of pallets.

Foldable:

The fact that they are foldable means that they can be stored when they are not needed, helping to save space in the workplace.

Heavy duty lifting:

At cranes direct we stock models with SWLs (Safe Working Loads) of up to 500kg to 1000kg, meaning we can help you with all your lifting and lowering needs. Remember to abide by the SWL of your working equipment –this is extremely important to ensure employees are safe.

Fast set up:

Due to their smaller size, these cranes take both a short amount of time and space to setup, meaning work can be completed at a faster rate.

2.5 Demerits

- Disadvantages of hydraulic crane is that it is used for handling is messy, and it can be difficult to totally get rid of leaks in a hydraulic system.
- If hydraulic fluid leaks in hot areas, it may catch fire.
- If hydraulic lines burst, they can cause serious injuries.
- Load can't be carrying an angle.
- Hydraulic fluid is highly corrosive.

3. COMPONENTS USED IN HYDRAULIC FLOOR CRANE

It is necessary evaluate the particular type of forces imposed on components with a view to determining the exact mechanical properties and necessary material for each equipment. A very brief analysis of each component following components,

- 1. Long hydraulic jack
- 2. Metal wheels
- 3. Brackets
- 4. Bolts and nuts
- 5. Lock pins
- 6.'c'-channel
- 7. Square pipes

1. LONG HYDRAULIC HAND JACK;

This component is considered as a strut with both ends pinned. It is subjected to direct compressive force which imposes a bending stress which may cause buckling of the component. it is also subjected to internal compressive pressure which generates circumferential and longitudinal stresses all around the wall thickness. Hence necessary material property must include strength, ductility, toughness and hardness.

2) METAL WHEELS;

The wheels are position at the base part of the crane lift and enable to move the crane from one place to another place without necessary employment of external equipment.

3} SQUARE PIPE'S;

They are used to build the frame and fix the hydraulic jack.

4} BRACKETS;

An object that that is attached to base of the frame used to support or holds the objects is called as a bracket.



Figure 3: Hydraulic Floor Crane

5) BOLTS AND NUTS;

They are used to connect the c-channel & square pipes, so as to form a pin joint. One links turns with the respect to other.

6) LOCK PINS OR COTTER PINS;

These are used lock the ram, so as to prevent the locking or loosening of nuts during the operation of the tiers.

7} `C'-CHANNEL;

It is used to make the base platform. It supports the entire structure of the crane lift. It is used to make the folding the square pipes.

4. COST ANALYSIS OF MATERIAL

Table 2: Cost of the material used in the fabrication of the Hydraulic Floor Crane

SL NO.	Material description	Quantity required	Unit cost	Total cost(RS)
1	Square pipes 50*50*3mm thick	6	356.66	2140
2	Bolts and nuts	27	18.88	510
3	Electrodes	200	2.5	500
4	C section 3mm thick	2		444
5	Lock pin	2	15	30
6	Hydraulic cylinder	1		6490
7	Big wheels	4	390	1560
8	Small wheels	2	110	220
9	Bushes	4	20	80
10	Fabrication			5000
11	Painting			225
12	Transportation of raw materials			565
13	Other expenses			4585
14	Gas welding			390
15	Hook	1		250
16	1 m chain			360
Total				RS 23,349/-

5. CONCLUSION

The fabrication of hydraulic floor crane elevated by a hydraulic cylinder was carried out meeting the required design standards. The portable floor crane is operated by hydraulic cylinder which is operated by a hand. The hydraulic crane is simple in use and doesn't require routine maintenance. It can also lift heavier loads. The main constraint of this device is its high initial cost, but has a low operating cost. This crane is very useful for lifting and transportation of heavy jobs from one place to another place like in automobile, repairs and service, workshops, production industries, material handling units etc. In material handling crane play important role in modern manufacturing industries. In our project we aim to fabricate a hydraulic operated floor crane for handling various kinds of materials.

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"Art is not what u see, but what you make others see"

YANTHRIKA - 2019 **DME**

Student co-coordinators



We are very joyous and feel extremely lucky and blessed to be a part of this endeavour in contributing my small efforts to this News Letter- YANTHRIKA, as it stands as a testimony to my humble contribution today when I reminisce about my Alma mater and college days and live the past down the



memory lane. I would also take the GANESH C [6th Sem]

MD AYAN [3rd Sem]

opportunity to thank my co-ordinator and classmates in contributing their efforts along with me and my lecturers, principals for guiding me and motivating me to give my best to this *News* letter.

Chief Editor



Mr. Basavaraj G Lecturer

It gives me immense pleasure and satisfaction to present this year's News letter - Yankthrika of Mechanical, it is a source of pride for our college to showcase the talent of our students in other activities apart from studies, as our college is meant to explore other talents along with curriculum and being a responsible citizen. I heartily thank all talented youngsters for coming forward to demonstrate their talent and lending a hand for publishing this magazine and making it a success. Looking forward to catch the young talent and helping them to explore their talent in the future too.

Drafting the model, Casting the world, Forging the campus, shaping the universe, welding the rest of all branches, Bcoz, We are the Men, We are the machine, and we are Mechanical Engineer's of...... **SGP**

