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DESIGN OF FIXTURE TO IMPROVE MECHANICAL CLUTCH LINKAGE

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The project is in designing a fixture to improve mechanical clutch linkage. The clutch is one of the main components in automobiles. The project is about placing the clutch connecting rod and clutch pedal lever in correct position to allow the free play to the driver. When the clutch rod which is not in the correct length it will increases or decreases the free play of the clutch it will causes very difficult to driver to engage or disengage the gear. This can be identified after the assembly of the chassis and the engine and we are going to readjusting the clutch rod to obtain the free play. During this rework process, the time consumption of assembly of the vehicle increases and production rate is decreases. To avoid this error in the clutch rod assembly we are going to design a fixture to improving the clutch linkage. This fixture will reduces the rework and time consumption.

INCREASE OF EFFICIENCY IN COOLING TOWER

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The main aim of this project work is to increase the efficiency of cooling tower which is used for diesel engine power plant. Increasing the efficiency of cooling tower results in effective cooling of the engine, which thereby increases the oxygen content leading to proper combustion of fuel and hence the fuel consumption is automatically decreased. This is achieved by placing an additional cooling system within the sump area. This setup consists of blowers which sucks the atmospheric air and supply it to the sump with required flow rate, volume and pressure through the pipelines. Air makes a contact with water through holes in the form of air bubbles. Due to this, convection process occurs .The contact time between air and water causes heat transfer to occur from water to air. This heat transfer occurs until the air bubbles reach the surface of water, once the air bubbles reaches the surface. The fan placed on top of the cooling tower, which ensures the flow of air. Thus the temperature of the water in the sump can be reduced from 36 ^{0}C to 33 ^{0}C, which thereby increases the efficiency of the cooling tower from 66 % to 77%.

INCREASING THE PRODUCTIVITY OF THE BILLET SAWING MACHINE

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In our day to day life, many processes are getting improved for many reason like improving the productivity, increasing its efficiency, reducing the time factor, eliminating the errors in processing, eliminating or for reducing the man effort in the process. Likewise the ultimate objective of our project is to increase the productivity of the billet sawing machine. **In** this project we suggest some modification to the existing machine by redesigning the some parts of the auto loader, main and shuttle vice. The rod resting area and feeder area of the auto loader has been modified by raising the height of the rod resting area and also designed the feeder to hold two rods vertically. And also the dimensions of the main vice and the shuttle vice have been redesigned to hold the two rods vertically. Hence by making the above alteration the billet productivity will be increased.

EMISSION CONTROL IN DIESEL POWER PLANT

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Oxides of Nitrogen (NOx) and oxides of Sulphur (SOx) are the major pollutant that comes out from engine exhaust of GMR Diesel Power Plant. The NOx concentration level is 1100 parts per million (ppm) and SOx concentration level is 190 parts per million (ppm). Since Oxides Of Nitrogen (NOx) concentration level is higher it affects our environment to great extent. Our main objective of our project is to reduce Oxides Of Nitrogen (NOx) concentration level to lower rate of parts per million (ppm). The Oxides Of Nitrogen (NOx) concentration level is higher in GMR Diesel Power Plant as they didn't install any oxides Of Nitrogen (NOx) control methods.

We suggested to use Selective Catalytic Reduction (SCR) method for controlling Oxides Of Nitrogen (NOx) emission. In Selective Catalytic Reduction method ammonia (NH3) is used as a reagent, which is injected into the exhaust gas stream. Ammonia (NH3) reacts with Oxides Of Nitrogen (NOx) present in the exhaust and it is converted into Nitrogen (N_2) and water (H_20). It is proposed that, if Selective Catalytic Reduction (SCR) system is installed in GMR diesel Power Plant, NOx concentration level is expected to reduce from 1100 parts per million (ppm) to 132 parts per million (ppm).

SHELL AND TUBE HEAT EXCHANGER

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This project is mainly focusing on designing one type of a heat exchanger which is shell and tube heat exchanger. Step by step on designing, the software is build first to make the work on calculation easy and simple by using e- NTU method. This method technically more simple than LMTD where it has to refer to a complex graph to calculate certain outputs that needed. It consists of formulas of calculating parameters in heat exchanger such as heat transfer coefficient, heat transfer rate or heat capacity rate. To design this heat exchanger, many considerations were taken. The shell size must be adaptable to the water flow rate. To determine how many tubes that are used also depends on the size of the shell. Water flow rate can be determined by using ball valve opening. The opening is decided to be50%, 60%, 65%, 75% and 100%. To read the temperature, a thermometer digital is attached at inlet and outlet for both hot and cold fluid. The five readings were taken and take into calculation using the software that has been build. The manual calculation is done to check the program in the software whether it is compatible. From the results obtained, the heat transfer rate rise up when the mass flow rate increased. Lastly the most suitable and economical heat exchanger is decided. And to conclude the heat exchanger in the design as the result is same.