

MINISTRY OF HIGHER EDUCATION
AND SCIENTIFIC RESEARCH
UNIVERSITY OF DIYALA
COLLEGE OF ENGINEERING
MECHANICAL ENGINEERING DEPARTMENT



BALANCING OF ROTATING MASSES

A PROJECT

SUBMITTED TO THE COLLEGE OF ENGINEERING

UNIVERSITY OF DIYALA

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE BSC

IN

MECHANICAL ENGINEERING

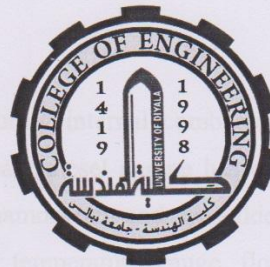
BY

Askiyar Khalil And Mohameed Gatfan

Supervised by

Dr.Eng. Zaid Salim Hamody

Republic of Iraq
Ministry of higher Education and
Scientific Research
University of Diyala
College of Engineering
Mechanical Engineering Department



MANUFACTURING INTERNAL COMBUSTION

SYSTEM WORKING IN DIESEL FUEL

by

SALAM N. NAJI

ABDALLRAHMAN A. FADEL

Under the Supervision:

Dr.lutfi yousif

ABSTRACT:

In this project we design and manufacturing internal combustion system Working by diesel fuel. We prepare diesel engine has one cylinder and we design mechanical dynamometer and we added parameters(speed gauge, pressure gauge, temperature gauge, flow meter).

Objective of the project:

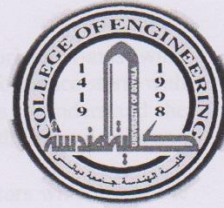
- 1)Fuel flow rate.
- 2)Torque.
- 3) Q_{supply} .
- 4)Brake power.
- 5)Specific fuel consumption.
- 6)Brake efficiency.
- 7)Exhaust temperature.
- 8)Difference in pressure.
- 9) brake mean effective pressure.

Ministry of Higher Education and Scientific Research

University of Diyala

College of Engineering

Department of Mechanical Engineering



The Performance Study Of Wind Power Station

Project Submitted to Mechanical Department ,
University of Diyala ,College of Engineering
as Part of Requirements of the Degree of Bachelor
Science in Mechanical Engineering

Presented by:

**Muhanad Nazhan Mohamed ,
Riab Lateaf Mal Allah , Douaa Nama Ahmed**

Supervised by:

Lecturer. Samir D. Ali

2012

I-Abstract

The greatest object of this device is designing horizontal-axis wind turbine (HAWT) blades to achieve satisfactory levels of performance starts with knowledge of its parameters and this will help the students to understand the fundamental mechanisms for the horizontal wind turbine with in the details and equations

One of the objectives of this research was to determine factors which have the greatest influence on the motions of the horizontal axis wind turbine ,and show load changes influence on the wind turbine motion and know the way to draw conclusions about a particular configuration is to exercise similar sensitivity studies for that turbine.

These comparisons of load change are for illustrative purposes only and should not be applied literally to any other wind turbine

It is important to note that the sensitivity results presented in this report are felt to be generally valid and applicable to a variety of wind turbines.

Ministry of Higher Education and Scientific Research

University of Diyala

College of Engineering

Department of Mechanical Engineering



Study of Single and two stage

Air compressor

Project Submitted to

Mechanical Engineering Department

University of Diyala-College of Engineering,

as Part of Requirements of the Degree of Bachelor

Science in Mechanical Engineering

Presented by:

Ahmed Ali Kamil

Juwan Salih Sallah Al_deen

Supervised by:

Lect. Samir Dawood Ali

2013

Abstract

There are three ways of connecting the air compressor (single stage, two stage, two stage with intercooler). In this experiment we make tests to these ways of connection by calculating the volumetric and isothermal efficiency and compare between the results of these ways and indicate to the better way of them.

By calculate the volumetric efficiency and isothermal efficiency of connection ways. And calculate the actual work done per cycle, indicated power and isothermal work. And compare the volumetric efficiency an isothermal efficiency of connection ways. And define the effect of inter cooling on the isothermal efficiency.

Mechanical Engineering Department

University of Diyala College of Engineering

as Part of Requirements of the Degree of Bachelor

Science in Mechanical Engineering

Presented by

Ahmed Ali Kandil

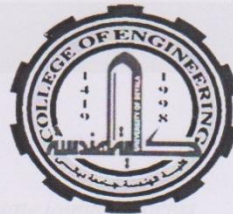
Juwan Salih Salih Aldeen

Supervised by

Leel Samir Dawood Ali

2017

**Ministry Of Higher Education
And Scientific Research
University Of Diyala
College Of Engineering
Mechanical Engineering Department**



Design And Manufacturing Of Fixtures Of Friction Stir Welding Machines

**A Thesis Submitted To College Of Engineering As
partial Fulfillment Of The Requirements For The
Degree Of Bachelor Of Mechanical Engineering**

By

**Esraa Raad Mahdi
Kamal Amer Hasaballah
Oras Yaseen Abdullah**

Supervised By

**Asst. Prof. Dr. Adel Kh. Mahmoud
Lecturer Mr. Sami A. Nawi**

June 2013

Shaaban 1434

ABSTRACT

Friction stir welding (FSW) is a relative new solid-state joining process. This joining technique is energy efficient. In particular, it can be used to join high strength aerospace aluminum alloys and other metallic alloys that are hard to weld by conventional fusion welding. In this project the design of the fixtures for FSW machine are made for achieving FSW process for joining of aluminum alloys. Fixtures for this work was largely manual in nature. Welding was carried out on fixture and flat metal plate (backing plate), that was specially made; it was a (350*300*17)mm steel plate plotted to the machine table. Fixturing butt joint in place on the backing plate consisted of two clamp steel part (250*60*12). Each part was clamped down on to the machine table using two (M17) bolts which were fixing the butt joint along both side and above in the direction parallel to the weld axis.

Supervised By

Asst. Prof. Dr. Adel E.H. Mahmoud

Lecturer Mr. Sami A. Nawi

June 2013

56ashun 1434

Ministry of Higher Education and Scientific Research
University of Diyala
College of Engineering
Department of Mechanical Engineering



***MAINTENANCE AND-DEVELOPMENT OF HYDRAULIC
TRACING SYSTEM***

Research Submitted to
University of Diyala ,College of Engineering
as Part of Requirements of the Degree of Bachelor
Science in Mechanical Engineering

Presented by:

Marrwah Magid Fandy

Douaa Khaleel Ismail

Supervised by:

Assist.Proff.Dr.Saad Theyyb Faris

Lect. Sami Ali Nawi

2013

The aim from project:

The project is instructive project and practically for production purposes in various form.

**MAINTENANCE AND DEVELOPMENT OF HYDRAULIC
TRACING SYSTEM**

Research Submitted to
The University of Diyala, College of Engineering
as Part of Requirements of the Degree of Bachelor
Science in Mechanical Engineering

Prepared by:
Martwah Mapid Fandy
Douaa Khaleel Ismail

Supervised by
Assist.Prof.Dr.Saad Theyya Faris
Lect. Sami Ali Nawi

2017

MINISTRY OF HIGHER EDUCATION
AND SCIENTIFIC RESEARCH
UNIVERSITY OF DIYALA
COLLEGE OF ENGINEERING
MECHANICAL ENGINEERING DEPARTMENT



**DESIGN AND MANUFACTURING OF
INSTRUMENT USED FOR CALCULATING
RESONANCE FREQUENCY OF A
CANTILEVER BEAM CARRYING A
VIBRATING MASS**

A PROJECT

SUBMITTED TO THE COLLEGE OF ENGINEERING

UNIVERSITY OF DIYALA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF BSc

IN

MECHANICAL ENGINEERING

BY

Zainab Mohan and Haneen Amer

Supervised by: Asst. Lecturs :

Mohammed Ismael and Omar Ahmed

2012-2013

Abstract

Some times air bubbles exist in the pipes of fuel because of many reasons most of them are the low level of fuel in the tank or a leakage in the fuel pipe, these air bubbles effect on the performance of the engine. The ultrasonic system is designed to eliminate the effect of air bubbles. This system contains a fuel tank, pump, volumetric control, fuels filter and source of ultrasonic waves which generates ultrasonic waves of a frequency of 40 KHz, the designed system works properly and areas of air bubbles are reduced.

Ministry Of Higher Education

And Scientific Research

University Of Diyala

College Of Engineering



***Design and manufacturing of water and air dug
for diesel engine***

A Thesis Submitted

By

Amani Jamal Abdalrahman

Ruba Mohammed Abdalazeez

To

The council of Mechanical Engineering Department in

College of Engineering

As a partial Fulfillment of the Requirements for the

Degree of BSc in Mechanical engineering Science.

Supervisor

Assist.Professor.Dr.Mudhafar Kareem Abdullah

2013

-Abstract

The objective of the present project is to design and manufacturing of instrument used for studying the response of a cantilever beam to a vibrating mass .The designed instrument can be used to studying the dynamic response to a any two degree of freedom harmonic excited force such as a beam excited by a bending and torsion forces applied at the same time ,then the resonant mode may be bending or torsion mode .The manufactured instrument is simple and constructed from a strain gauge as a vibration sensor placed at the root of a cantilever beam and a data acquisition circuit used for displaying the response (amplitude – time) wave on the computer monitor .The instrument may be used for studying the resonance phenomenon , the effect of rotating unbalance mass and the effect of eccentricity of a rotating disk.

REPUBLIC OF IRAQ
MINISTRY OF HIGHER EDUCATION
AND SCIENTIFIC RESEARCH
COLLEGE OF ENGINEERING
MECHANICAL ENGINEERING DEPARTMENT



DESIGN AND MANUFACTURING OF CREEP TESTING EQUIPMENT

A PROJECT

SUBMITTED TO THE COLLEGE OF ENGINEERING

UNIVERSITY OF DIYALA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF BSC

IN

MECHANICAL ENGINEERING

BY

SARAH NAJI

NOOR HAZIM

SUPERVISED BY

ASST. LECTURER MOHAMMED I.HAMED

ASST. LECTURER HUSSEIN B. MOHAMMED

May

2013 A.D.

رجب

1434 A.H.

1-1 Introduction

The field of materials behavior at elevated temperatures has seen a formidable wealth of advancements over the last century. These accomplishments were made possible by the work of many scientists and engineers throughout the world who developed critical technologies necessary to make high-temperature materials stronger and more reliable [1, 2, 3]. Applications for these materials include jet engines, power generation facilities, automobile engines, and electronic devices [4, 5]. The potential efficiency of these systems typically increases with increasing operating temperature. This natural trend provides a strong demand for materials that can withstand higher temperatures. For aerospace applications, there is also a strong need for reducing weight, and it is often the high-temperature materials that have the highest densities in the aerospace structure. Reduced weight has been achieved by reducing component geometry, leading to greater stresses in high-temperature materials. Naturally, the importance of reliable creep and stress-rupture testing increases with increasing service stress. Introducing new high-temperature materials that have lower densities is another means by which weight reduction goals have been met for aerospace structures.

In materials science, creep is the tendency of a solid material to slowly move or deform permanently under the influence of stresses. It occurs as a result of long term exposure to high levels of stress that are below the yield strength of the material. Creep is more severe in materials that are subjected to heat for long periods, and near melting point. Creep always increases with temperature.

Ministry of Higher Education
& Scientific & Research
University Of Diyala
College Of Engineering
Mechanical Department



Design & Manufacturing Of Educational Ice Maker Unit

A PROJECT

SUBMITTED TO MECHANICAL ENGINEERING

**DEPARTMENT / COLLEGE OF ENGINEERING AS A PARTIAL
FULFILLMENT OF THE REQUIRMENTS FOR THE DEGREE OF**

B.SC. IN

MECHANICAL ENGINEERING

Supervised By:

Dr. Eng. Muzher Taha Mohammed

BY

Ziyad Mohammed Salman

Mohammed Khudair Abbas

And Mohammed Essam Tahir

2013-1434

Introduction:

It may be defined as the process of removing heat from a substance under controlled condition. It also includes the process of reducing and maintaining the temperature of a body below the general temperature of its surroundings. In other words, the refrigeration means a continued extraction of heat from a body whose temperature is already below the temperature of its surrounding.

For example, if some space (say in cold storage) is to be kept at -2°C (271K), we must continuously extract heat which flows into it due to leakage through the wall and also the heat which is brought into it with the articles stored. After the temperature is reduced to -2°C (271K), thus in a refrigerator heat is virtually being pumped from a lower temperature to higher temperature. According to 'second law of thermodynamic' this process can only be performed with the aid of some external work. It is thus obvious that supply of power (electric motor) is regularly required to drive a refrigeration. Theoretically, a refrigerator is a reversed heat engine or a heat pump which pumps heat from a cold body and delivers it to a hot body.

In the manufacture of commercial ice, ice is produced by freezing potable water in standard cans placed in rectangular tanks. The tanks are filled with chilled brine. For increasing the heat transfer from the water in the can to the chilled brine, the brine solution is kept in constant motion by agitators. The agitators can be either horizontal or vertical and are operated by means of electric motors. The brine temperature is maintained by the refrigeration plant at -10°C to -11°C . Ammonia gas is used as the refrigerant because of its excellent thermal properties. It also produces very high refrigerating effect per kg of refrigerant and low specific volume of the refrigerant in vapor state. The high temperature, high pressure ammonia vapors are condensed in a condenser which may be of shell and tube type or evaporative type. The condensed liquid

Fig(1.1).

**MINISTRY OF HIGHER EDUCATION AND
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UNIVERSITY OF DIYLA
COLLEGE OF ENGINEERING
MECHANICAL DEPARTMENT**



**MEASUREMENT OF FORCED CONVECTION HEAT
TRANSFER FROM CIRCULAR CYLINDERS**

**A PROJECT SUBMITTED TO THE COLLEGE OF
ENGINEERING
UNIVERSITY OF DIYALA IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING**

**By
Ahmed Abdul-Rahman Ahmed
and
Mustafa Hafudh Mohammed Salih**

June 2013

**By supervised of :
DR. Jasim Mohammed Abdul-Latif**

MINISTRY OF HIGHER EDUCATION AND
SCIENTIFIC RESEARCH
UNIVERSITY OF DUYLA
COLLEGE OF ENGINEERING
MECHANICAL DEPARTMENT



ABSTRACT

Experimental investigations have been conducted on steady state forced convection heat transfer from the outer surface of horizontal circular cylinders in cross flow of air. An experimental investigation of forced convection heat transfer from an isothermal circular cylinder has been conducted in the present work.

A project module has been fabricated to study heat transfer from horizontal circular cylinders in cross-flow of air. The experiments covered the laminar region with a range of Rayleigh number of order of 10^5 in air. Experimental measurements of temperature profiles have been made by using fine wire thermocouple thermometry. Average heat transfer data are determined, and an empirical correlations are suggested. The cylinders are heated using internal constant heat flux heating elements. The temperatures along the surface of the cylinder are measured. Average Nusselt numbers are obtained for various Reynolds numbers. Empirical correlations are obtained for the overall averaged Nusselt numbers and Reynolds number using the diameter of cylinder as a characteristic length. Nusselt number is found to be proportional to one-third power of Rayleigh number.

June 2013

By supervised of :

DR. Jagan Mohammed Abdel-Latif

