

HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

MAJOR OVERHAUL AND PERFORMANCE
TESTING OF A STEAM PUMP

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M/975

JUNE 2003

**HIGHER TECHNICAL INSTITUTE
NICOSIA-CYPRUS
MECHANICAL ENGINEERING DEPARTMENT**

DIPLOMA PROJECT 2002/2003

Project Number: M/975

Title: "Major overhaul and performance testing of a steam pump"

Objectives:

1. To conduct an investigation into the design, constructional and operational features of steam engines and steam pumps.
2. To describe with reference to drawings and diagrams the steam engines and steam pumps stating the above features.
3. To disassemble the existing steam/pump clean, repair, adjust and assemble again.
4. To connect to the steam boiler and adjust and optimize performance.

Terms and Conditions:

1. Special attention should be given to safety, functionality, reliability and appearance.
2. Spare parts and assistance will be provided.
3. Attention should be given to the proper connection to the steam boiler.

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Supervisor : Mr Panayiotis Tramountanellis



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ACKNOWLEDGMENT

I would like to express my deep appreciation to my project supervisor Mr. Panayioti Tramountanelli, for his help, advices and guidance he showed through this project.

I would like to express my thanks to Chief Inspector Mr. C. Kalogirou for all the technical information given by them and the personal experience gained through out the project.

Finally I would like to express my thanks to my friend Alexi Kourtella, Christo Christou and my cousin Niko.

The project is dedicated to my Parents, Michali and Sotiroulla Stylianou.

STYLIANOU STELIOS

MAJOR OVERHAULL AND PERFORMANCE TESTING
OF A STEAM PUMP

The purpose of the project was to conduct an investigation into the design, constructional and operational features of steam engines and steam pumps. Also in my duty was to describe with reference to drawings and diagrams the steam engines and steam pumps stating the above features.

When the necessary information's were taken from my investigation I was start the overhaul of the existing in our Plant laboratory, steam pump. Firstly I disassemble the steam/pump and I was clean the different parts which was in no good condition due to the water exist inside the steam/pump for a long period.

The parts, which were damaged, were repaired and few parts like screws and bolts, which were destroyed, were ordered to make to lathe. Then, when the necessary adjustments were done the steam/pump was assembled again. Finally I connect the steam engine to the steam boiler with the appropriate way so its operation can be understandable from new students.

INTRODUCTION

Steam Engine

For the steam engine, an honored place in history is assured. Early developments were made by pioneers such as French physicist Denis Papin (1647-1712) and English engineer Thomas Newcomen (1663-1729), and fundamental improvements came from Scottish engineer James Watt (1736-1819), to mention but a few. In modern times, steam turbines and internal combustion engines have largely replaced the steam engine due to their higher power outputs, higher efficiencies and smaller bulk for a given power output. However, many steam engines are used in various countries of the world, particularly on railways.

A steam plant has a low noise level and atmospheric pollution can be low if a high efficiency burner system is installed in the boiler unit. There is also a high degree of flexibility in the possible fuels used in the boiler unit.

Early steam engine plant produced steam at about atmospheric pressure, mostly in or introduced into a vertical engine cylinder, thus lifting the engine piston. The back of the piston was open to atmospheric pressure.

By condensing the steam in the cylinder as a result of the application of cooling water, a vacuum was formed in the cylinder and the atmospheric pressure, acting on the back of the piston, produced a net force to drive the piston downwards. Thus a work done by the engine when the piston ascended as the steam was formed, and again when the steam condensed as the piston descended. The general technique was adopted for many years, and in various forms, until boilers were developed which were capable of producing steam at pressures above atmospheric and until engine valve gear was developed to introduce and exhaust the steam to and from the engine cylinder.