

HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

DESIGN AND CONSTRUCTION OF A
PORTABLE SHEET METAL CUTTER

M / 802

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JUNE 1997

**DESIGN AND CONSTRUCTION OF A
PORTABLE SHEET METAL CUTTER
M/802**

by

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AND
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Project Report
Submitted to:

the Department of Mechanical Engineering
of the Higher Technical Institute
Nicosia Cyprus

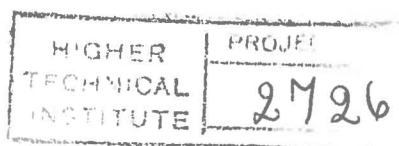
in partial fulfilment of the requirements
for the diploma of

TECHNICIAN ENGINEER

in

MECHANICAL ENGINEERING

June 1997



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ACKNOWLEDGEMENT

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ACKNOWLEDGEMENTS

The authors would like to express their gratitude and thanks to their Project Supervisor, Dr. L. Lazari, Lecturer in Mechanical and Marine Engineering Department of H.T.I., for his guidance and assistance.

They would also like to thank Mr. K. Kyriakou for making his workshop available to them and for his constructive comments and encouragement during the construction of the portable sheet metal cutter.

Finally they would like to express their thanks to Mr I. Angeli, laboratory assistant of 1st grade in the Mechanical Department of H.T.I., for his help on the purchase of materials.

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SUMMARY

Design and Construction of a Portable Sheet Metal Cutter

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The purpose of this project was to design and construct a portable sheet metal cutter that would be able to shear metal plates of 50 cm maximum width and 2 mm maximum thickness.

Firstly, an engineering approach was followed in order to obtain scientific and commercial information on existing sheet metal cutters. Then, the theory on shear was developed followed by the execution of appropriate design calculations and selection procedures of materials and dimensions. Also a stress and cost analysis was executed.

Finally, all the parts of the construction were manufactured, the portable sheet metal cutter was assembled and tested.

The project is divided into five chapters:

- CHAPTER 1 Shearing Machines
- CHAPTER 2 Shear
- CHAPTER 3 Design and Construction
- CHAPTER 4 Stress Analysis
- CHAPTER 5 Cost Analysis

INTRODUCTION

After research studies through the Cyprus market to find machines for cutting sheet metals, it was observed that a great variety of machines exists.

Sheet metal can be sheared or cut to size from sheets in very many ways. The particular method chosen depends on several factors such as the size and shape of the parts required and the numbers off needed. The dimensional quality of the cutting in this work is not usually high, and varies slightly from one cutter to the next, the exceptions usually lie in the range of smaller sizes, where if the quantities are reasonable, the quality is high. The quality of shearing itself, however, has to be reasonable and the part free from any serious distortion.

A new type of sheet metal cutter was designed and constructed in order to satisfy the following objectives.

- a) Shear metal plates of 50 cm maximum width and 2 cm maximum thickness.
- b) Be portable, i.e. be easily carried to works outside of the workshop when necessary.

In order to succeed these, a certain procedure was followed, shown in the next chapters.