HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

DESIGN OF A MOVABLE WORKING PLATFORM

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by

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Project report

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A C K N O L E D G E M E N T S

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D E T I C A T I O N

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Thank you for your caring and your support.

C O N T E N T S

S U M M A R Y

This project deals with the design of a movable working platform for two persons and relevant equipment.
It is however divided in four chapters.
The first chapter gives all the available information about the existing movable working platforms, as can be seen in the market, worldwide.
The second chapter is about the actual design of the movable working platform which is a scissor lift, able to raise a weight of 350kg(including platform weight) at a height of 5.4m .Also, were available,materials to be used are selected.
The third chapter is about safety using movable working platforms. Safety procedures, safety precautions and accessories are given.
The final chapter includes technical drawings of the scissor platform.

I N T R O D U C T I O N

From the ancient times, above ground level tasks leaded to the need of considering ways of lifting weights and workers. Indeed from those years manlifts were invented and that was something which saved a lot of manpower.

Nowadays this need continues to exist, and furthermore the facilities such manlifts are expected to offer are getting more and more sophisticated.

There are different types of manlifts using different structures and power to raise a load. Various capacities and variable working heights are available, depending on the type of each platform and its corresponding characteristics detailed research about the existing types of manlifts or movable working platforms, with their specifications and features has been done in chapter 1.

Designing a movable working platform, which in this case is a scissor platform involves fundamentals of mechanical engineering, electrical engineering, hydraulics and other. In this project the most significant aspects of the scissor platform are investigated, always from the mechanical engineering point of view, with respect to loads and forces acting on the structure, stresses on the joints and and design considerations of the hydraulic system needed to raise the load.
All design considerations comply with British Standards as given in BS 6289, BS7171 and BS 5323.

The main problem that had to be faced was how the applied load on the platform was distributed as a force on the different members of the structure.

Applying simple mechanical Laws (Newton's Laws) we can easily observe that the forces acting on members are compressive with an axial sense and direction. These forces are for equilibrium equal with opposite senses for each member. Due to symmetry forces acting on the same members are respectively, all the way down, the same.

We always examine the worst case, which is when scissors are fully opened, forming an angle of 45 degrees from the center axis.