R.T. Jie-A-Looi *Redesigning the Oilquick OQ 45 quick coupler*
Engineering Assignment, Report 2006.TL.7060, Transport Engineering and Logistics.

OilQuick AB is a Swedish company which manufactures several types of quick couplers for earth moving machinery, for example excavators and wheel loaders. Currently a new earth moving machine is being developed by the Delft University of Technology and Diverto Technologies BV. This new machine will require a quick coupler which is significantly lighter than the current models from supplier OilQuick. Because of this a lighter quick coupler has to be designed for use with the new machine.

The assignment is to design a quick coupler based on OilQuick's OQ 45 quick coupler specifications with a target weight of 30 kilograms.

First the current quick coupler was analyzed with the Finite Element package Ansys to get an overview of the peak stresses and their locations. Next several weight reduction methods were reviewed to choose the method which was best suited for this assignment, which was to manufacture the quick coupler from low density high strength material. Several commonly used engineering materials were reviewed and a selection of possible high strength aluminum alloys was made. Finally the quick coupler was redesigned to be manufactured out of high strength aluminum alloy.