

Rotatruck Vs Standard Hand Truck Comparative Assessment Report - April 2011

1 Executive Summary

The aim of this assessment is to provide a quantified and objective comparison between a standard hand truck and a Rotatruck Self Supporting Hand Truck, when undertaking the most common actions or activities associated with hand truck use.

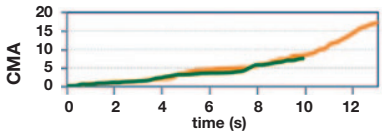
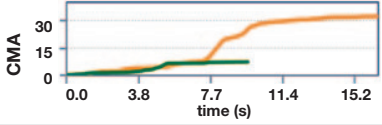
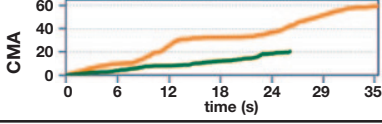
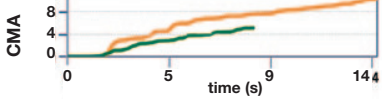
In industry hand trucks are commonly referred to in different markets as hand trolleys and/or dollies. For the purpose of simplicity this report will refer to them hereafter as hand trucks.

The Back Strain Monitor (BSM) was used to quantify movements and muscle activity of the lumbar spine while two workers carried out six frequently performed activities.

The parameters measured included muscle activity of the lower back (representing effort required to perform an activity), the degree of lower back flexion (how far the lower back had to bend to complete the task) and the time taken to perform a task.

The following table is a summary of the actions/activities assessed and their respective results achieved.

Key: — Rotatruck — Standard hand truck

	Typical Hand Truck Activity 105 Kg (230 Lb) Test Load	Cumulative Muscle Activity (CMA) % Maximum Voluntary Contraction	Reductions Achieved		
			Time	Effort	Bending
1A Muscle	Load Pull Back Pulling back the load ready for transporting or at way points such as doors or traffics lights etc.		21%	59%	32%
1B Movement		 Flexion - Lumbar Spine bending (sagittal plane)			
2	Curb Negotiation Ascending a curb face or a change in level.		41%	78%	
3	Confined Space Operation Entering and rotating 180° within a confined space such as a lift or storeroom.		28%	65%	
4	Doorway Navigation Navigating through a doorway with a self-closer.		41%	67%	78%
5	Transporting a Load Around Obstacles Navigating a loaded hand truck around a set of obstacles.		Marginal	62%	
6	Vertical Maneuverability Keeping a load close to vertical while rotating 360°.		43%	51%	

The results showed objective and quantifiable differences between the two hand truck systems for the activities assessed. For each of the six activities assessed, there were clear benefits seen when using the Rotatruck Self Supporting Hand Truck in each of the three domains assessed; muscle effort, flexion of the lower back and time efficiency.