The L.A.D.
Electric Wheelchair to Riding Lawnmower Assist Device

BME 4910 Final Presentation
Friday, April 22, 2011

TEAM 16
JOSHUA AFERZON
MICHAEL CHEN
MATTHEW DESCH

Client Information:
Ronald Hiller
54 Fitts Road, Ashford CT, 06278
860-429-7966
Overview

- Introduction
- Purpose
- Previous work
- Specifications
- Design
- Components
- Budget
- Acknowledgements
Introduction—Client information

- **Client: Ronald Hiller**
  - Ashford, CT
  - Age: 56
  - Height: 5’10”
  - Kind and charitable
  - Suffers from multiple sclerosis
  - Ron maintains complete upper body function and limited lower body function
Multiple sclerosis

- An inflammatory disease where the myelin sheaths are damaged
- Affects communication between brain and spinal cord
- Disease onset occurs usually in young adults
- Effects between 2 and 150 per 100,000 individuals
- Can be caused by genetics, environmental factors and infections
Purpose

- To design an assistive lift that will allow Ron to easily mount and dismount his lawn mower.
- To require as little maintenance as possible.
- This transition can only be accomplished by using his upper body.
The L.A.D.
Previous work

Bruno Turnout/Carony Transportation System

Hydraulic pump

http://www.avmmobility.com/Turney%20w%20Carony%20Back.jpg

http://www.okokchina.com/Files/uppic16/Hydraulic%20pump%20with%20round%20base495.jpg
Previous work

- **Personal power chair lifts**
  - Hard to move/not mobile
  - Heavy
  - Doesn’t handle transfer of person to lawnmower chair
  - Safety concerns
  - Not weather resistant
  - $2400

[Image of a personal power chair lift]

http://s.sears.com/is/image/Sears/00870848000?hei=248&wid=248&op_sharpen=1&resMode=sharp&op_usm=0.9,0.5,0,0
Specifications

- The L.A.D. is:
  - Lightweight
  - Sturdy and safe
  - Mobile
  - Easy to use
  - Comfortable

- The L.A.D.’s innovative components:
  - Reliable braking mechanism
  - Adjustable bridging system
  - Hydraulic pump to perform vertical displacement
  - Seat belt
Design

C.A.D. 
Metal Skeleton 
Finished product
The final design has several components, categorized as follows:

- Base and wheels
- Base/pump connector
- Hydraulic pump
- Pump/seat connector
- Bridge and sliding mechanism
- Seat and safety rails
- Lawnmower attachment
- Seatbelt
Components—base and wheels

Base

Wheels
Components—base/pump connector
Components—hydraulic pump
Components—pump/seat connector
Components—bridge and sliding mechanism

Bridge

Sliding Mechanism
Components—seat and safety rails

Seat

Safety Rails
Components—lawnmower attachment & seatbelts

Lawnmower Attachment

Seatbelts
### Budget

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<th>Part</th>
<th>Quantity</th>
<th>Shipping</th>
<th>Price</th>
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<td>3&quot;x2&quot;x1/4&quot; wall rectangle steel tube</td>
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<td>Spray paint, screws, washers, tarp, etc.</td>
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<td>Egg crate, decals, pillow case</td>
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Money spent: $833.33

Money allotted: $1000

Budget: $166.67
Acknowledgements

- Dr. Enderle
- Marek & Emily
- Mr. Ronald Hiller and his family
- Kerrie Wenzler & Jenn Desrosiers in the BME office
- Pete Glaude & Serge Doyon from SOE Machine Shop
Questions?