Shane’s Lawnmower and Sean’s Bed Railing Device

Team 4
Final Presentation
Randy Corriveau, Eric Nastuk, and Ian Wallis
Shane Davis

- 20 years old from Ashford, CT
- Shane has cerebral palsy, and he uses a power wheelchair
- The affect on Shane’s motor control is not as severe as Sean’s
Shane’s Needs

- Shane is an ambitious young man who is striving to expand his responsibilities
- Previous attempts to cut his lawn failed
- Old mower was uncomfortable to sit in and was difficult to operate the steering
- Needs a lawn mower that doesn’t cause damage to his legs and can be steered similarly to his wheelchair
Design Objective

- Modify a ride-on lawn mower so that Shane Davis can operate it comfortably and safely
Shane’s Lawnmower

- 42 inch mowing deck
- Hydrostatic transmission
- Step through
- Accessible hand controls
Modifications to Mower

- **Drive**
  - Actuated
  - Allows for forward, reverse, and neutral to be joystick accessible

- **Steering**
  - Joystick operated

- **Seat**
  - Higher back
  - Armrests on either side
  - Seatbelt

- **Transferring assistance**
Modifications (continued)

- **Safety**
  - Lanyard for emergency shutoff

- **Microcontroller**
  - Will receive input from joystick controller, and power actuators and motors
Sean Stenglein

- 13 years old from Columbia, CT
- Sean has severe athetoid cerebral palsy, giving him limited control of his limbs, and spastic movements
- He walks with the help of an assistant and has limited speech abilities
- His abdominal region provides him adequate support while sitting
Sean’s Needs

- Sean requires special sleeping arrangements to keep him safe during the night.
- He needs a bed rail and help from an assistant to safely get in and out of bed.
- The current bed railing system requires large amounts of time and energy to operate.
- In need of a new system and method for performing this daily task.
- Also needing repairs to two past design projects – Assistive Jumping Device and the S90 Go-Kart.
Design Objectives

- To restore the previous projects to working order
- To construct a safe, sturdy bed rail and stair system that helps Sean Stenglein get in and out of bed
Bed Rail Device (BRD) for Sean

- Consists of 3 main parts:
  - Frame
  - Support section
  - Stairs

- Purpose: to assist Sean as he transfers to and from bed.
  - Keep him physically active and to help with his motor skills.
BRD Frame

- Made of aluminum from 80/20 Inc
  - Two horizontal pieces.
  - Four vertical pieces.
  - Joined together by corresponding corner brackets and joining plates.
  - Will be covered in a medium cell foam and have a vinyl coating.
BRD Support System

- Goes underneath the mattress pad.
- Will be mounted to plywood that goes across the struts of the bed.
- Hinges allow frame to have 180 degrees of motion to fold down.
Stairs

- Also constructed out of aluminum.
- Will slide underneath bed when it is not in use.
- Adjustable so can be used as Sean ages.
- Will allow Sean to safely transfer to and from bed.
BRD Mechanical/Electronics

- Two motors will raise and lower the BRD frame, also will ensure that the frame stays locked in place when not in use.
- A dial will be used to turn the BRD on/off and to raise and lower the BRD.
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**Total:** $360.57
Acknowledgements

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- The Stenglein family
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