

Sportsmobile Bed Design

Mechanical Engineering

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Abstract

Sportsmobile is in need of a bed design to maximize van cargo space for the adventurous customer to haul their extreme toys. The purpose of this design is to provide a comfortable and user-friendly hideaway bed, which will open the van floor space while providing extra storage. The key aspect maintained throughout the design is the ability to sustain customizability to accommodate all customers and their needs.

Folded Isometric View



Figure 1 - Folded bed frame in the upright position for travel to maximize storage. Mattresses housed inside folded box, while top of panel provides a workbench option.

Folded Isometric Description

- Bed frame is built off of box-like supports
- Boxes provide support and added bed width
- Bed frame boxes are built over the wheel well to hide this feature
- Boxes provide a hideaway place for water tanks and electrical components
- Any leftover space in the boxes can be utilized as a built-in cabinet

Slider Bar for Support



Figure 2 - Unfolded bed focusing on piano hinges and slider bar, which provides a rigid support for the panels. The slider bar is maneuvered through an internal stainless steel bar to be moved into the locked and unlocked positions.

Slider Bar for Support

To provide hinge support, our design facilitates a slider bar on both sides of the bed frame.

- The slider allows for rigidity along the weaker points of the frame
- The purpose of the slider is to provide strength and eliminate a support leg
- The elimination of support leg maximizes cargo storage beneath the bed in the unfolded position

Unfolded Isometric View



Figure 3 - Unfolded bed frame to showcase entire width of bed and L-bracket, which provides support for panels in the upright position.

Specifications

- Bed frame dimensions
 - Length: 75.775"
 - Unfolded Width: 64.5"
 - Height Folded: 38.5"
 - Height Unfolded: 17.35"

Simulation

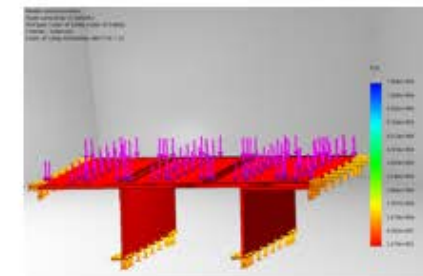


Figure 4 - Unfolded bed frame to determine factor of safety for the design. Applied loading of 550 lbs per panel.

Materials

- Panels: Exterior grade A plywood
- Slider bar: : 304 steel
- Slider bar housing: : 304 steel
- Piano hinge: : 304 steel
- L-bracket: : 304 steel
- Safety catch: zinc plated steel
- Mattress: memory foam