Paraplegic Wakeboard Suspension Design and Testing

Abstract

The Paraplegic Wakeboard Suspension provides paraplegics with a comfortable and safe environment as wakeboard riders. Due to their disabilities, people with paraplegia either are not able to enjoy standard wakeboarding, or cannot afford it due to the high prices the current market holds. The current market for suspension attachments for wakeboards is very limited and costly for those looking to get into the sport. Our competitors, such as Swaik, have accomplished the task of distributing the oscillatory loading produced by the waves and transmitted to the rider via their full-flex suspension system. Although their design is costly, starting around $2000, the cost of our suspension, wakeboard, and seat altogether will be less than $1000. Additionally, the major improvement in our suspension system is the addition of two DNM adjustable air shock absorbers to allow precise control for multiple wakeboarding scenarios. The design is also modular in that it can be placed on any standard sized wakeboard via M6 bolts. The prototype of the suspension is made with 2x4 wood and 1x3 wood, and will undergo structural testing before the final suspension can be built using aluminum. The final suspension will undergo testing that validates the initial design requirements.

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