



# Adaptive Seating for Single Rider Golf Carts

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## PROJECT OVERVIEW

The purpose of this project was to design, build and test a safe and reliable system to position an individual, with no lower extremity mobility, in an effective golfing position.

The constraints of the project included:

- Design must move golfer from seated to partially standing position.
- Design must also keep golfer's knees from locking
- Should allow for complete golf swing and clearance of cart.

The objectives of the project included:

- Design had to comply with RESNA wheelchair and seating standards.
- Seat had to be sized appropriately to fit a reasonable percentage of golfers.
- Seat should include a system to stabilize the pelvis, legs and torso during game play.
- Design needed to attach easily on to a common single rider golf cart.

## HOW IT WORKS

This design solution is a pivoting three piece seat with a dynamic torso support and harness designed to support a golfer without back muscles. The design allows the user to rotate their upper body through a golf swing. It consists of a bottom piece that is rigidly attached to a set of parallel links on each side. These links are connected to the back support at one end and to the foot support at the other. An electromechanical linear actuator is attached to the back support and moves the golfer from the seated position to a partially standing golf stance.

Benefits of adaptive golf seat:

- Allows a person with no lower extremity mobility to play golf from a partially standing posture.
- Golfer can choose whether to swing with one arm or both.
- The foot support plants itself into the grass stabilizing the entire seating system to provide a stable platform to swing against
- The total cost for all parts and components was very reasonable.

### Stage 1

### Stage 0



### Stage 2



## SEAT MOTION DESCRIPTION

The seat operates in two stages of motion. Stage 1 describes the range of motion between 0 degrees (seated/horizontal) and 33 degrees tilted forward. Stage 2 corresponds to seat motion between 33 degrees and 45 degrees from the seated position. During Stage 1, an electric linear actuator raises and therefore inclines the sitting surface about a pivot point 6 inches behind the front of the seat. This lifts the back of the seat and lowers the foot support, which contacts the ground when the sitting surface has reached an angle of 33 degrees of forward tilt from horizontal. If a golfer desires a seat angle between 33 and 45 degrees to golf, the actuator can lift the seat into Stage 2. During Stage 2 motion, the seat pivots about a second pivot point located at the front of the seat, which allows the foot support to stay stationary on the grass while the sitting surface continues to increase in slope. The linear actuator is controlled via a jog switch to extend or collapse it.

## PROJECT OUTLOOK

The adaptive seat will allow a person with no lower extremity mobility to partially stand in a golfing position. The adaptive seat could also benefit a person who has suffered from a stroke and only has use of one side of their body. We hope this project helps make the world of golf more available to all people

