

T.flex

Enjoy The Unbalance

Introduction

T.flex Leaning Bike brings freedom of movement and flexibility to adaptive sports. Its aim is to add excitement and adrenaline rush to the solid and boring wheelchairs. A four wheeler with the freedom of a two wheeled vehicle.

Why T.flex?

All the pictures share one iconic moment, the fluidity and freedom of leaning sideways to achieve ultimate pleasure and excitement when turning. A position not feasible in the solid structure of traditional wheelchairs.

T.flex has no steering anymore, your hands will only generate power.

No steering! Your hands will only generate power.

As the athlete's hands are busy with generating power for moving and braking, they can't operate a turning mechanism. That is the reason why T.flex turns without the use of hands.

Leaning to your right = Turning right

Balancing your weight = Straight Forward

Leaning to your left = Turning left

The driver leaning side ways to make right or left turns. A Four-Bar Linkage attaches the steering structure to the seat and chassis. This transforms the leaning movement into turning of wheels.

A New Way of Biking!

T.flex is a completely hand-powered heart-rate sport which is Inspired by "Seated Cable Row" exercise in gym. Power bars located on each side of driver's seat are pulled and pushed to operate the wheels. The position and the angle of the handles are set to take full advantage of the athlete's power and to maximize the efficiency of human body.

Two gearboxes installed inside each wheel are responsible for transforming the power directly to the wheels.

Driver's ergonomic position while pulling and pushing the power bars is shown in the picture.

Features

+ 3D Printed Structure: The light weight T-shaped structure is 3D printed with alloy. It is primarily responsible for the turning mechanism. It also acts as the weight-bearing counterpart of the chassis.

+ Hubless Rear Wheels: In order to provide a better visibility of the surroundings and to avoid injuries caused by wheel blades the rear wheels are designed hubless.

+ Chassis: The main weight-bearing structure of T.flex is its carbon fiber chassis.

The part which holds the vehicle together is the Four-Bar linkage under driver's seat.

+ Seating: The driver's seat is designed to be suitable for all users with limited lower mobility such as paraplegics and amputees. It also protects the athlete against mud and dirt.

+ Turning Mechanism: The core idea of T.flex is its steering system which transforms the side leaning movement of driver into turning of front wheels.

+ Front Wheel: The front wheel's angled axis provides camber while turning.

+ Suspension System: Strut and coil spring suspension components attach the driver's seat to the four-bar linkage. This will guarantee a smooth and comfortable ride in any terrain.

Ergonomics

On T.flex, the riding position is highly customizable to meet different body characteristics. Legs positions are divided into four major categories as introduced below:

1. Non Paraplegic: In this position, the athlete puts her/his foot on a fixture attached to the 3D printed structure. A pad fills the seat's extra depth and keeps the body at a suitable height.

2. Paraplegic: If the athlete is comfortable with bending her/his legs under the body, a weight-bearing pad will lift the torso preventing body weight from hurting the legs.

3. Lower Limb Amputee: A customized fixture is attached to the 3D printed structure and keeps the legs in a comfortable position.

4. Upper Limb Amputee: In this position, the athlete sits on a pad which fills the seat. Her/his body will be harnessed to the seat using the seatbelts.

The seat is one of the most important parts of the T.flex experience, and it should be highly adjustable in order to satisfy athletes with different body characteristics.

+ Body Harness: Comfortably holding the athlete attached to the seat.

+ Leg Room: The seat is specially designed with extra depth so that the athlete can place her/his legs comfortably under the pad.

+ Customizable Seat Pad: The pad prevents the body weight from putting pressure on legs. This pad is attached to the side panels of the seat.

+ Adjustable Foot Rests: Responsible for holding the legs in place. This part is detachable.

The Championships

T.flex is a manifesto for both on-road and off-road competitions with their very own characteristics. It combines some exciting features of other extreme sports and adapts them to a wheeling competition.

+ Off-Road Competitions: Uphill and downhill, mud pods, rocky roads, exciting slopes and bumps are the challenges which are enjoyable when riding T.flex

+ On-Road Competitions: Athletes will compete on a combination of high grip and semi-slippery surfaces with their endurance and maneuvering abilities.