

The Toyota Sit-Ski: How TRD USA Is Helping Transform Adaptive Sports

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Like drivers on a racetrack, when para alpine skiers hit the course, they rely on their world-class skill, determination, and the technology beneath them to race their fastest. As a proud partner of U.S. Paralympics Alpine Skiing, Toyota Motor North America (TMNA) thought of a way to support these athletes even further as they chase their dreams. That's where Toyota Racing Development USA (TRD USA) came in and lent its engineering and technology expertise to develop the first-ever [Toyota Sit-Ski](#).

The Toyota Sit-Ski will bring adaptive sports to a whole new level, says U.S. Paralympian and Team Toyota athlete Andrew Kurka.

"I've never ridden anything so great in my entire life," Kurka says. "It's what all monoskis are going to be emulated from; I can guarantee that. With or without my successes, Toyota just revolutionized Paralympic alpine skiing for sit-skiers around the world."

The sit-ski project is part of Toyota's ongoing commitment to the Paralympic Movement and continued efforts to work toward mobility for all. Originally developed for use by U.S. Paralympic Alpine Skiing, the revolutionary monoski has been tested and used in competition by three-time Paralympian Kurka and five-time Paralympian Laurie Stephens, both of whom competed in the Toyota Sit-Ski during the Beijing 2022 Paralympic Winter Games. TRD USA also enlisted the help of five-time Paralympian Chris Young to provide feedback throughout the testing and development of the rig over the last couple of years.



For Young, working with TMNA's U.S. racing arm to develop a sit-ski from the ground up made perfect sense. When it comes to the equipment in motor racing and sit-skiing, the two sports have many of the same focus areas, including pressure, angles, suspension, mechanical changes, the seating and fit for the rider.

"Having Toyota and TRD USA behind this is the perfect mix," Young says. "We do the same things. We try to go fast."

A Team Effort

From the beginning, the Toyota Sit-Ski project has been a team effort, with athletes like Kurka working closely with a diverse team of TRD USA engineers and technicians on the exciting collaboration. A former ski racer herself, Senior Engineer Trish Wall was immediately interested in the mission of the project: making skiing more accessible.

“Skiing is freedom,” Wall says. “You can go as fast or as slow as you want. If more people can access the mountains, that’s a win for me.”

The Toyota Sit-Ski project opened Wall’s eyes to how it can be a real challenge for Paralympic athletes and hopefuls to access quality equipment. According to the engineer, sit-skiers often buckle themselves into their rigs with ratchet straps — polyester webbing usually used to secure cargo to flatbed trailers — which often need to be replaced throughout the season and can also cause the athletes to have skin blisters and wounds.

“These athletes are professionals and they’re out there with ratchet straps around their waist, securing themselves to the rig, throwing themselves down the hill at 70 miles per hour,” she says. “They deserve better.”



Wall was the perfect fit for this project because she's the best of both worlds: a skier and an engineer. Young enjoyed working with her as well because when the legendary Paralympic alpine skier needed to describe what movements he uses to make a sit-ski turn, she knew exactly what needed to be done to improve the experience for other adaptive athletes like Kurka.

The Sit-Ski in Action

To develop the Toyota Sit-Ski, TRD USA engineers captured live-action data straight from the slopes. Technology including 3-D scanning allowed for the TRD USA team to get hyper-specific dimensional accuracy for the sit-ski blueprints and design. After data testing, the prototype went through a rigorous fitting, testing and detailing process.

For adaptive equipment like sit-skis, ergonomic fit is crucial to the rig's success because it needs to be able to withstand the terrain while also fitting the rider.

The Toyota Sit-Ski has seen snow all over the world while testing, including at actual World Cup competition. Team USA athletes have skied the rig throughout Europe and North America, racing it in Colorado, Switzerland, Norway, Canada — and most recently, at the Paralympic Winter Games.

“Win, lose or draw, it’s an awesome monoski,” Kurka says. “This ski in general increases my aerodynamics, increases my comfort — while diminishing the variables that would push me off course,” he says. “That’s really all you can ask for in a sit-ski.”