

Human Powered expedition to the South Pole

Description

On 27th December 2013 Maria Leijerstam became the first person to cycle to the South Pole. Maria rode a unique recumbent trike, specially designed and built for the expedition. Maria rode alone, with a support team nearby in case of emergency.

This remarkable achievement was made possible by a combination of human power and engineering.

This application is made by Inspired Cycle Engineering (ICE Trikes) who designed and built the recumbent trike used in the expedition.

Design challenge

The Antarctic environment and route provided a number of design challenges. Extremes of temperature, wind speed, terrain, gradient, and other factors outside the usual scope of HPV design had to be carefully considered. The machine had to be mechanically efficient, ergonomic and comfortable to maximise Maria's personal performance. Finally, the machine should be tough and durable, since the most minor failure could jeopardise the expedition.

Technical

All production trikes made by ICE are trikes suitable for long distance touring and are proven in many arduous adventures. However, some aspects of the design had to be altered for the trike to meet the design objectives.

The fat trike for Maria's expedition was based on a standard ICE Sprint trike. The Sprint's cruciform, made from heat-treated 4130 chromoly steel, was ideally suited to Antarctic conditions. The standard mesh seat was also ideal with an ergonomic shape and comfort that Maria would need on such an arduous journey. The steering geometry, a hallmark of ICE Trike's famed handling, was also retained.

ICE designed and built a new back-end to hold a 4.8" wide Surly 'Lou' snow tyre. ICE added spikes to the tyre for added traction on ice. Surly 'Larry' tyres were used on the front. Wheels were built on Hope 'FatSno' hubs.

The gearing was based on a Shimano 12-36 9-speed cassette with a 2:1 mid-drive step down to give a bottom gear of 8.7". The design incorporated Q-rings to help reduce the effects of 'dead-spot'. 3 heavy-duty YBN mountain bike chains were combined to drive the trike.

The final special component was a custom-made rack, large enough to fit over the rear wheel and hold the equipment that Maria would need for her expedition.

Outcomes

Maria completed the challenge in a time of 10 days, 14 hours and 56 minutes, covering 638km, and setting two world records: first to the South Pole, and fastest to the South Pole. The trike performed exceptionally well and did not suffer any mechanical failures.

Maria's expedition raised the profile of Human Powered Vehicles around the world. The recumbent trike was featured in many online magazines, blogs and social media platforms, as well as being reported on television, radio and in newspapers.

A documentary about Maria's human powered cycle to the South Pole will be shown in the UK, on a major television channel, in January 2014.

Contact information

Lois Leonard, Marketing Officer

Email: sales@icetrikes.co
Phone: +44 (0)1326 378848
Web: www.icetrikes.co



Credit: Daniel Pearce



Credit: Ryan Edy