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Cal Poly Students Work to “Package” Humans in a New Off-Road Tricycle

SAN LUIS OBISPO – A Cal Poly Industrial Technology instructor and graduate students of the Orfalea College of Business are set to begin testing the riding comfort of a newly developed off-road tricycle, Friday and Saturday, Feb. 15 and 16.

Cal Poly Industrial Technology (IT) instructor Adam Stephens designed a new long-travel, full suspension off-road tricycle as part of his graduate work while at Cal Poly.

IT Professor, Jay Singh, and his students from the Advanced Packaging Dynamics for Distribution course will use field data recorders donated by Lansmont Corporation to help test the trike for vibration and shock ruggedness.

Lansmont President David Huntley, a 1996 Cal Poly IT graduate, is working closely with Singh and the students, providing SAVERTM field data recorders that will capture information on drop height, impacts, vehicle motion, vibration, temperature and humidity.

IT Area Chair, Professor Louis Tornatzky is excited about the trike and the team’s use of an adaptive technology for alternative purposes. “The SAVERTM sensors are normally used to monitor distribution hazards that packages are often exposed to. By using packaging testing technology to test a human powered vehicle we’re essentially ‘packaging’ a human being in an off-road trike.”

Observations, such as the effect of a rider’s weight, surface conditions and “peddle induced bobbing,” will be made in relation to the performance of the trike.

Stephens fabricated the trike to absorb shock, rather than the rider. For the frame he used an aircraft-grade aluminum alloy to keep the trike light, provide rigidity in an off-road environment and allow it to track well.

The wheel spindles are made of heat treated 420-stainless steel, which is traditionally used to make surgical instruments and industrial shear blades.

“The stainless is a harder alloy and will take more abuse than typical steel, and it minimizes weight while being strong enough to support a single sided axle,” says Stephens.

“The idea was to design a vehicle that would allow people with back problems the ability to navigate off-road terrain in comfort.” The 26 year-old instructor suffers from chronic back pain due to a compressed disc – he missed a landing after jumping off a sand cliff on a bicycle.

The ‘Berserker’ sports two front wheels and one rear, all with their own shock absorber. It also uses larger front wheels than most traditional tricycles. The handle bars are positioned under the seat and the rider pedals with their feet in a reclined position.

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