ParCar, Briggs & Stratton unveil revolutionary electric motor system

BY ANDREW OVERBECK

REEDSBURG, Wis. — In a unique joint venture agreement with Briggs & Stratton, Columbia ParCar Corp. has unveiled its new, more efficient ACE Electromotive Power System in select golf cars and utility vehicle models.

The new cars use Briggs & Stratton's new Elek electric motor system that utilizes neodymium permanent magnet technology allowing for a motor that is 50 percent smaller and 20 pounds lighter. As a result, the new ACE EPS 48v Electric Eagle golf car is 10 to 15 percent more efficient and 30 pounds lighter.

"By utilizing a permanent magnet motor, there is no need to use battery energy to generate a magnetic field," said Ward Utterback, ParCar's manager of sales and marketing support. "The power is used more efficiently, significantly reducing heat energy loss, thus providing more energy for motion."

According to Utterback, the new car's efficiencies will add up to cost savings. "You can get more rounds of golf per car, spend less time charging and save electricity," he said. "In addition you can control speed with the accelerator, leading to less brake wear."

A FIRST FOR BRIGGS & STRATTON

Sensing a market shift towards electric power sources, Briggs & Stratton, which makes 11 million gasoline engines a year, saw a need to diversify into making electric motors.

"If things keep going electric, like they have in golf cars, we need to get involved in electric motors," said John Fiorenza, director of business development for Briggs & Stratton.

Briggs & Stratton, which has been developing the permanent magnet system for the past five years and holds a patent on the motor, formed a joint venture with ParCar to get the motor ready for production.

The Elek motor uses a permanent magnet.

The deal will also allow Briggs & Stratton to expand its capabilities for golf course and sports mapping applications, according to Lee. "This will make us the experience and knowledge that we need to effectively expand our presence in the extremely important markets that they serve."

EXPANDING PROSOURCE ONE'S REACH

The deal will also allow ProSource One to respond to its growing client base of golf courses and other professional sports venues.

Littleton, Colo.-based GroundLinkx LLC and Bordentown, N.J.-based Mapping Events is a provider of site-planning services and GIS programs.

"The sports mapping division allows us to consolidate the individual strengths and industry recognition of all three companies into a one-stop mapping and GIS source for golf courses and sports organizations," said Michael Piatt, IntraSearch president.

The new division will package its high-resolution aerial mapping and 3D topographic imagery of sports and entertainment venues with GroundLinkx geographic information/site-analysis programs.
LiDAR mapping
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With LiDAR we were able to map the site in a more time-efficient and cost-effective manner," said TSC's construction coordinator Tom Mead. "Typically, aerial photographs are used to make the maps. We had already flown the property but because of the vegetation we could not get accurate readings with that technology," he said. "The LiDAR was extremely accurate even with the thick vegetation."

**HOW DOES LiDAR WORK?**

"LiDAR takes GPS to the next level because it integrates GPS with inertial navigation systems," said Aerotec CEO Jim Dow. LiDAR, which stands for light detection and ranging, combines a powerful laser sensor with a Global Positioning System (GPS) receiver, inertial GPS unit, a custom pilot navigation system and a helicopter deployment platform to provide precise 3-D coordinate point data.

From above, the laser that is mounted to the underside of the helicopter emits rapid pulses of near-infrared light. The time it takes the laser light to conflict with any feature is measured and converted into a point location, thus mapping the site in X, Y and Z coordinates. "Using LiDAR, as many as 35,000 points can be captured every second," said Greg Ina, manager of computer sciences for Davey Resource Group. "The speed at which LiDAR data is captured allows for the compression of project timelines originally estimated for conventional surveys. The data are then used to create a topographical map of the site. Developers and architects are able to see even the smallest details."

Ina said the high volume of laser light data allows the terrain to be surveyed even through dense vegetation. "LiDAR data penetrates dense vegetation through volumes of laser light emissions," he said. "Up to 35,000 pulses of laser light can be released per second from a laser scan survey unit. Although leaves and tree branches conflict with the laser light path and the ground, the sheer density of information ensures coverage through vegetation. Employing laser scan data involves supervised and unsupervised data classification algorithms, the process always involves the elimination of unwanted data."

**TIME IS MONEY**

Using LiDAR, the data to map the Texas site was collected in approximately 11 minutes. "When you factor in air time, the whole process takes only half a day," said Dow.

The results are provided to the client rapidly. "From the time we ordered the service to the time we had our maps, it took three weeks," said Mead.

The Aerotec team consists of a helicopter with a two-man crew in addition to two on the ground who record GPS point data. The mapping at Dallas National cost about $25,000, said Swayze. Cost varies depending on the size and the shape of the site.

In addition, LiDAR surveys offer accuracy that is beneficial at each stage of development and course maintenance. The results are in electronic format and are Geographic Information System-ready and can be re-used for future projects.

"Because the topo can be overlaid with the ortho-photos, the golf architects have a visual representation of the terrain," Swayze said. "With LiDAR, architects can see the features right in the topography, so they can choose to incorporate the features into the design of the course. These features can also be rendered into 3-D models for visualization purposes."

Jennifer Lennox, communications specialist with Davey Tree Expert Co., contributed to this article.

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