

## Brutus Strength

The battery pack can be recharged in under 3 hours from a standard power point.

Brutus's illumination comes from full HID and LED lighting, The digital instrument display is also a Manzanita unit, the LighTech carbon fiber rear view mirrors sit above the grips, and there are 50mm, inverted, 3-way, 14-point, adjustable front forks. The fuel tank is not just there for show, it's hinged to allow keyed access to the batteries and a small storage area - big enough to hold a pair of gloves and some tools.

Brakes are dual disk six piston up front and there are dual calipers on the rear disk one controlled from the foot peddle, one from a level where the clutch once was. Being a low production unit the price is US\$35,000 so you'll have to save your pocket money to get one.



Now here's a neat looking E- Bike! Los Vegas based Chris Bell is producing the Brutus 2, a Lithium Polymer powered cruiser.

Brutus is a 240kg monster that contains a 153V 4.9kWh battery driving a D&D brushed DC motor via a Manzanita manufactured Zilla 1K controller.

In an interesting control concept the 153v are limited to 88 or 96 volts to the motor in an effort to reduce voltage and current sag on the battery, “- *theoretically extending battery life* -“ in fact the battery is expected to last more than 80,000km. The two voltages are dependent on the setting chosen by the rider either ECO or Performance.

And speaking of performance, Brutus can get from 0 to 100kmh in 4.7 sec and top speed is over 160kmh, range is about the same numeral, 160km. Not bad for a golf cart motor, but then again there is a clutchless 5 speed manual transmission, chain driven from the motor to give the right amount of Oomph for any situation.



## eO eO eO A Rallying I will Go

The motors have a peak output of up to 315kW for brief periods to allow eO to negotiate particularly steep sand dunes that are found in Atacama Desert in Chile.

A full battery will provide up to 150 km driving range across the most difficult rally terrain and up to 300 km in less demanding conditions. Dakar stages are several times these distance, so OSCar eO is fitted with an electric generator that is driven by a V6 Nissan race engine fed from its own 200 litre fuel tank. Propulsion is still 100% electric. However there is a petrol range extension unit mounted in the rear of the car but coupled only to a 60kW electric generator for battery charging.



Latvian race car producer OSCar has created an all electric rally vehicle for the recently run Dakar rally. The eO finished the 9000km rally in 77<sup>th</sup> place beating its fuel powered team mate that had to retire during stage 14.

Our old friends at Winston Batteries sponsored and supplied the 52kWh packs that were used during the rally.

Donerre Suspension supplied an intriguing dual regenerative damper - linear alternator - suspension system that allowed harnessing of electrical energy from the oscillatory movement of the shock absorbers and thereby providing additional energy for battery recharge.

eO is driven by two powerful permanent magnet electric motors configured to provide regen braking. With a combined nominal power output of 180 kW the eO can get along at a top speed of 150 km/h.

eO is designed specifically as an EV class operating in the Dakar, and does not aim to compete against the conventional vehicles entered by manufacturers and private teams; though it performed extremely well against them.

## ABB Fast Charge



In the central Dutch city of Utrecht, ABB has deployed the first two direct current (DC) Terra systems, which were officially opened in early December 2011. Another charger was installed at a BP service station in Rotterdam, with two more to follow at locations to be identified early this year.

ABB produces two versions of its Terra recharge stations that can energise an EV battery in as little as 15 to 30 minutes – compared with eight hours when using a regular alternating current (AC) power outlet.

Seems that Utrecht-based taxi company GreenCab has a reasonable fleet of 20 EV taxis that require recharging throughout the day at various points around the city; GreenCab even went to the trouble of financing the installation of one of the stations to increase autonomy for their fleet. At the same time opening up the EV recharge options for private owners. ABB may be onto a winner. *“Now if only we can convince the local service stations to install recharge points around Victoria!”*

## EV-STER



This car seems strangely familiar; however there is a new twist to Honda's EV-STER, it was announced at the Tokyo Auto show in December that the STER is to leave the dismal lows of a prototype vehicle and enter the dizzy world of production vehicle. There is just one problem, seems that Honda is in a quandary as to which power plant to shoehorn into the bodywork. Interest from perspective purchasers is split between the prototype electric system and an infernal combustion drive.

We may have to get onto the local Honda agent and tip the balance in favour of the NICE option.

This neat looking open top, two seater, rear wheel drive sports coupe certainly looks the part; but its EV performance is a bit disappointing with a maximum power output of 58kW and a 0-60 time of 5.0 seconds – note that is 60kmh. Maximum speed is impressive at 160kmh but if 0-60kmh is

5sec, getting to 160 may take a while.

Battery info indicates a 10kWh Lithium Ion unit that is limited to a maximum discharge of 58kW – *“There would seem to be the problem – you can't push the little battery pack too hard.”*

Range is 160km under JC08 standard testing and charging only takes 3 hours from your average 240volt socket.

Honda also claims that STER gives the driver the ability to customise motor output and suspension settings to suit personal preferences. One quirky concept which may not make it to production units is its twin-lever control instead of a steering wheel.



## The Shape of Things to Come??



## Lola – Drayson B12/69EV

At the 6<sup>th</sup> annual Low Carbon Racing Conference in Birmingham, Lola Drayson unveiled the B12, and all electric racing car capable of 0-100kmh in 3sec and 0-160kmh in 5.1 sec, with a top speed in excess of 320kmh. The car is the first in a series that Drayson Racing intend to bring to the 2013 FIA Formula E series - a world championship for electric racing cars.

The B12 is constructed on a Lola LMP1 chassis, with propulsion coming from four Oxford YASA-750 axial flux motors that can generate over 640kW. Power is supplied via a 700volt composite three part, 60 kWh battery; with recharging accomplished by a new state-of-the-art Qualcomm HaloIPT induction system that charges via pads placed on the floor of the garage. The batteries cells are the latest development from A123 Systems in the form of Lithium Nanophosphate units that are capable of providing approximately 15 minutes of exhilarating race performance. A single reduction gear links the drive from the electric motors to the driveshafts. Power control is in the form of Rhinehart inverters. Electronic control systems come courtesy of Cosworth, and there are Multimatic electrical regenerative suspension dampers to recoup as much wasted (heat) energy as possible.

*Could be an interesting competition to watch out for next year!*

## This Month's Q&A Technology Tip

Q: Are there any BMS systems that allow monitoring of battery condition as well as protect the cells while charging?



A: Manzanita Micro, the charger and new manufacturer of Zilla controllers, have developed the MK3x8 Digital Lithium Regulator that is a fully integrated BMS, data logger for 4 to 8 cells. The system looks after temperature and voltage levels from 1.75 to 5.5 volts per cell and its all

programmable via Ethernet cabling that communicates with the Manzanita chargers and controllers – Price \$320/board (OUCH!) See <http://manzanitamicro.com>