

Revenge of the In Wheel Motor!!

Now, each Protean Drive in-wheel motor can deliver 75 kW (100Hp) peak power and 1,000 Nm (735 lb/ft) peak torque, and weighs 31 kg. On a conventional 18-inch wheel with a typical tire size, top speed is approximately 120 mph. The motors are designed to fit behind any conventional 18 to 24inch road wheel, so they are suitable for most sized cars, crossovers, vans, Utes and even small trucks. They can be used in hybrids, PHEVs, or EVs, in rear-wheel, front-wheel or all-wheel drive applications – all using existing standard platforms.

The company is taking special care to ensure that the life cycle of the Protean Drive system will be 240,000 km/10 years, or roughly the life of the vehicle.

To prove Protean Drive's worth, a collection of eight demonstration vehicles, spread across four continents have been created. These include Volvo C30 and Ford F-150 all-wheel drive battery EVs, a Vauxhall Vivaro PHEV van. The flagship demo units are three Mercedes-Benz E-Class cars that specialty carmaker Brabus retrofitted into a hybrid and two EVs using the Protean Drive system initially for the 2011 Frankfurt Motor Show.

Production level pricing - \$1500



Protean Electric

Following a Global Financial Crisis induced hiatus; wheel motors have once again hit the drawing board. Protean Electric came to be only in 2009, the 80-employee company sprang from the ashes of PML Flightlink, an English company that began as Printed Motors Limited, making printed armature motors, in 1963. By 2003, PML had focused on developing in-wheel motors, which it was trying out in a solar challenge racing vehicle by the following year. In 2005, the company integrated power electronics into the in-wheel motor and christened the technology the Hi-Pa Drive. In 2006, the Hi-Pa drive debuted at the London Motor Show, and in 2007, became the basis of the legendary 700HP, 4000Nm Lightning GT Sports car.



GreenWing International

The eSpyder uses proven Lithium battery technology, similar to what is used by the leading electric car manufacturers. Charging is done by a custom designed charging system that monitors and manages the health of the batteries on every charge to ensure maximum performance.

eSpyder only weighs 186Kg and has a takeoff roll of 100m, as is the landing distance. Cruise speed is 60kmh and flight time is between 1 and 1 ½ hours. The Yuneec system, incorporates a 200mm diameter 12kg brushless DC motor, 680g speed controller, 75V/13Kwh Lithium battery pack and E-Charger that includes an integrated cell balancing unit that can recharge the aircraft in 2 to 3 hours. One fascinating item is the size of the propeller, a huge 65" (1.65m) two bladed carbon fibre unit that is directly rotated by the motor; Ah, the joys of electric motor torque. An ICE power plant would need a transmission weighting more than the motor just to swing such a prop.



To find out more see:

<http://greenwing.aero/>



Now here's something fun!! GreenWing International from California, are shipping their Espyder-E280 all electric ultralight (Experimental) aircraft. The eSpyder is available in the US for \$39,990 for an amateur built kit, or as a completed aircraft in Europe for €34,990. The eSpyder became the world's first electric aircraft to receive a national certification when it was awarded the German DULV approval in February 2013. This single seat open-cockpit aircraft offers pilots an unprecedented flight experience with the quiet, clean electric propulsion system allowing maximum flight enjoyment. Based on a proven airframe, the eSpyder has numerous improvements on its conventional powered cousin to create the ultimate personal flying vehicle for enjoying the thrill of flight without the noise, operating cost, or vibration of a traditional powerplant. The eSpyder uses a Yuneec PowerDrive 24 (24KW (32hp)) propulsion system that quietly propels the plane while the Motor Controller efficiently delivers power from the battery. The Yuneec System uses the best technologies to create an integrated system of: Motor, Motor Controller, Battery, and Charger to optimize performance, making electric flying simple and fun.

Solar Impulse



Catchup!!

Beginning on the 3rd of May, and ending on the 6th of July, the Swiss Solar impulse team headed by Bertrand Piccard and André Borschberg took off from San Francisco's Moffat airfield on a historic first leg of a Trans America Solar (only) powered flight to New York. 18Hrs and 18Min later after flying until 00:30AM and reaching a cruising altitude of 21,000ft the Impulse touched down at Phoenix Arizona's Air Park, a flight distance of 1203 Km at an average speed of 65.5kmh.

Next stop Dallas/Fort Worth 1541km away – Impulse cruised at up to 27,000ft at an average speed of 87kmh, flight time 18hrs 21min landing at 1:08AM. (Who said solar powered planes can't fly at night!!)

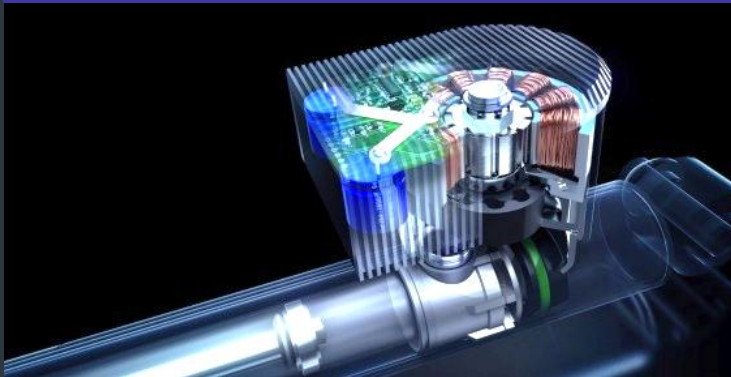
The third leg saw Impulse leave for St Louis at 4AM gradually ascending to 24,000ft to travel the 1040km distance at 49kmh arriving 21hrs 22min later at 1:28AM.

The Fourth leg to Washington DC was broken into two segments – firstly to Cincinnati, and then to Washington Dulles in time to join in on Flight event week at the nation's capital.

The final hop to New York took place on July 6th with touchdown at 11:06PM at John F. Kennedy airport.

Similar to the global circumnavigation by Planet Solar a few years ago, Solar Impulse took 2 months to cross the US as promotional engagements took priority. Well done Solar Impulse!

GenShock



Dubbed 'GenShock', by the development team at chassis and drivetrain manufacturer ZF Friedrichshafen, the active suspension system is being co-developed in partnership with Levant Power – a US-based company behind the original technology concept. Claiming the unit will be a world first once completed and brought to market, ZF says the system is the future of automotive suspension.

Aiming to combine the ride comfort levels of a luxury car with the dynamic handling characteristics of a sports car, GenShock further intends to have the ability to convert the kinetic energy of driving over bumps into electricity.

The compact unit is composed of a control unit, an electric motor, and an electrohydraulic gear pump. Driven by an electronically controlled electric motor, the gear pump regulates the oil flow in the damper.

The damping characteristic curve adapts to each driving situation automatically, and is designed to eliminate pitch during abrupt braking maneuvers and rolling during rapid evasion maneuvers. It is also capable of actively raising each individual wheel. Thus it aligns itself perfectly with stability control units, but with the added bonus of being able to generate electricity.

The valve system automatically uses the swaying motion of the damper piston to recover energy, and guides the oil in the damper in such a way that it drives the electric pump motor. This functions like a generator, converting kinetic energy into electricity and feeding it into the vehicle power supply. Obviously the system works best when operated on bumpy roads. Output seems to be in the 200W range and at 12V.

The Shape Of Things to Come!!

Lito Green Motion SORA



Now here's a futuristic EV that you can buy today; the SORA from Lito Green Motion of Montreal, Canada. The SORA is a 200km range (city cycle – 100Km Highway) latest tech electronics cruise bike. Powered by a 12kWh lithium polymer battery pack, that sits nice and low under the tank which encases all the incredible Lito electronic wizardry that includes regenerative braking, 3 control modes (performance, normal, safe range) as well as speedometer, battery charge level and warning lights, 5.7in. LCD with touch screen: GPS and LITO's application USB port. Drive comes from a liquid cooled 3phase motor that produces 90Nm of torque throughout the 0-6000 RPM range. The unique thing here is that the motor uses a constant velocity transmission (CVT); you can see it just in front of the rear wheel, rotating the rear wheel via a belt drive. One unique feature is the seat adjustment; the SORA has an electric system that allows on the fly ride height variation from 750mm to 850mm. Weight is a touch on the high side at 260Kg. Price – well the only reference I could find was indicating \$42,399 Canadian. www.litogreenmotion.com



This Month's Technology Review

Bosch is excited about its new SMG 180/120 (180mm X 120mm) electric motor, a petite 80KW, 200Nm powerhouse that weighs only 32 kilos and "fits inside a typical school backpack" (a handy feature – if your Inspector Gadget). The permanent magnet synchronous

motor is already used in several production vehicles, including the Smart ForTwo electric drive and Fiat 500e EVs, and the Peugeot 3008 diesel hybrid. Maximum revs are 12800 and the unit is electrically reversed by changing current polarity. This configuration allows for quick acceleration and transmissionless installations. Efficiency of the unit is in excess of 90% and is optimised for urban traffic conditions so efficiency and practicality are combined.