Around the World in 80 Days... On a Motorcycle

A team of 23 students at the Eindhoven University of Technology in the Netherlands has designed and built two prototypes of the Storm Wave — the first long-distance electric touring motorcycle. The team will attempt to ride around the world (26,000 km) in 80 days using only the existing electric power grid. The adventure began August 14, 2016.

To develop an electric motorcycle capable of traveling 380 km on a single charge, the STORM Eindhoven team overcame a variety of challenges. The first problem was powering the motorcycle for the distance required. The bike employs a modular battery pack of 24 separate cartridges, which lets the rider swap out individual batteries instead of recharging the entire pack. Modularity means that the motorcycle uses fewer batteries, which in turn provides a more stable and smoother ride thanks to a lighter overall weight. Accommodating fewer batteries also enabled the team to design the motorcycle with a lower center of gravity.

With the power problem solved, the team addressed aerodynamics. Generally, a motorcycle is not an aerodynamic vehicle because of the person riding it. The motorcycle itself may be aerodynamic, but once a rider sits on it the airflow is disrupted and wind resistance increases. STORM used ANSYS CFD software to analyze the aerodynamics of both the motorcycle and the rider by simulating and analyzing the turbulence, pressure drop and streamlines of the design. The students used this data to optimize the aerodynamic design and allow the motorcycle to travel farther while consuming less power. For instance, the Storm Wave has recessed areas for the rider’s legs, as well as a streamlined profile starting at the front and swooping back toward the rider, to reduce drag on the system.

The STORM Eindhoven team recharged their motorcycle batteries at both commercial and residential charging stations around the world to show the promise of electric vehicles. Spare battery cells were carried in support vehicles to be swapped out as needed.

Information provided by Bas Verkaik.

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