With the help of SOLIDWORKS software, Denis Manning’s BUB team established the motorcycle land speed record of 367.382 mph on Sept. 24, 2009, at the Bonneville Salt Flats in Utah.
When the BUB team began developing the SEVEN streamliner, Manning and collaborator Joe Harrelson, a retired mechanical engineering professor, decided to leverage 3D design, simulation, and manufacturing technologies to build a motorcycle that could carry a man over 350 mph.

The BUB team selected the SOLIDWORKS® 3D design system because it is easy to use, includes large-assembly tools, and provides 3D visualization capabilities, which help the team tackle its many technical challenges. The team also values the integrated SOLIDWORKS Simulation application for stress and vibration analysis, and SOLIDWORKS eDrawings® software for design communications.

DESIGNING THE WORLD’S FASTEST MOTORCYCLE

In addition to setting the record in 2009, the BUB SEVEN streamliner was the first motorcycle to travel over 350 mph in 2006. BUB’s achievement is the culmination of years of design work and development, all of which the team did in the SOLIDWORKS environment. One of the important innovations for the motorcycle was a custom-designed V-4 motor, an effort that Harrelson spearheaded.

“I first used SOLIDWORKS at California State University at Sacramento,” Harrelson recalls. “The software is very intuitive, and gave us the ability to model and optimize the vehicle’s components before building them.”

“Using a tool like SOLIDWORKS, our five-person team was able to do things on a world-class level,” Manning notes. “Having the fastest motorcycle on earth means a lot to me, and SOLIDWORKS allowed us to develop the streamliner cost-effectively. We were able to do things I would never have imagined back when I started.”
SIMULATION TO MINIMIZE TESTING

Using the stress and vibration analysis capabilities of SOLIDWORKS Simulation software, the BUB team will be able to minimize expensive rounds of prototype testing and improve vehicle performance. These studies will enable the team to reduce stress and vibration in the streamliner.

“FEA (finite element analysis) modeling is the key to doing this without breaking the bank,” Manning maintains. “SOLIDWORKS Simulation tools not only duplicate the information provided by testing, but also provide additional insights that testing might miss, such as the fact that the vehicle’s wheels will expand by a certain amount at higher speeds.”

PUSHING THE 400 MPH BARRIER

Because BUB set, lost, and re-established the speed record within a three-year period, Manning plans to keep going. He says he wants to continue development so that he can break BUB’s own record. “My goal is to go 400 mph,” he stresses.

“SOLIDWORKS software is what lowers the barrier for us to do this,” Manning adds. “Because of the design and simulation tools that we have available, we no longer have to build and smash the bike a few times, or blow an engine, before we are ready for a record attempt. We know the numbers, we know how to do this, and we will continue our work to set a new record someday.”

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