Harley-Davidson V-ROD Motorcycle

Harley-Davidson, symbol of the American spirit, began producing motorcycles in 1903. Since then, competition has forced Harley to redesign their bikes to fit the needs of their consumers. Requiring six years to complete, Harley-Davidson developed the fastest street motorcycle while still preserving the classic Harley style. The V-ROD was released to the public in 2001 and allowed Harley to be competitive in the professional drag-racing scene. In order to realize this motorcycle, Harley-Davidson incorporated the engineering design process.

Culturally, Harley-Davidson’s motorcycle represents luxury rather than speed and performance. Competition from foreign companies created a problem for Harley. Consumers cared less about the luxury aspect of the motorcycle, so Harley needed to build a faster bike to satisfy its customers. This change was reinforced by the dropping sales numbers. In order to restore their dropping profits, Harley researched their competition.

Inspired by the VR-1000 superbike, Harley used that engine for their models. The only problem was that the engine for the VR-1000 didn’t fit a Harley frame and the frame was not study enough to support the speed and power of the engine. This was their first big problem. They had to find a way to support the engine but keep the Harley look that was low and long. In order to achieve this they changed the frame from a standard one rail to two rails that surrounded the engine. They made the frame part of the styling. They also got some ideas from drag bikes where it would feel low and long. They built a prototype of the motorcycle and discovered many other problems. First there was not enough room for a big gas tanks. The metal container for gas was hard to bend and fit into the frame so in order to fix it they switched to plastic which seemed very unlikely for a Harley to have plastic, but it was the perfect solution. Plastic is very easily shaped and can be molded to fit any frame. They also realized in the first prototype that they needed a radiator. But they did not want the radiator to look like a radiator. They decided to place it behind the front wheel. There was a big problem here between the design team and the engineering team. To solve it they made the air come in through the side like scooping it into the motorcycle engine. They also used aluminum for the radiator.

For help on the engine they went to Porsche. Because on their first run to test the engine, the engine only lasted one weekend on full throttle and it had no noise control.

Once they solved some major problems they decided to make a 3d model of the bike out of clay. Clay was used because it can easily be reshaped without changing much on the bike. In doing this they realized that the gas pipe they had to have needed 12 liters of air and that it would not hold up as one big exhaust pipe. So they split the bike’s exhaust into two pipes for more storage and better stability.