Harley-Davidson V-ROD Motorcycle Engineering Process

The stages of engineering design process are essential in the design and production of any new product. In the 1990s Harley Davidson spent 6 years in this process to create the more powerful V-Rod bike. The creation of the bike was prompted by the fact that Harley Davidson was losing customers to companies that produced faster sport and racing bikes. They needed to come up with a way to include power and style in a newer version of the motorcycle. The problem they encountered was how to put more power into a cruiser while still maintaining the traditional Harley Davidson trademarked style. In order to design a faster Harley bike, the engineering team modeled the VR1000 liquid cooled engine after a race bike to set up a model to follow for the creation of the new bike. The team brainstormed engine ideas based off of the street version of the VR1000 but needed a new chassis version to hold more power. The team had to keep in mind the fact that with these new models, they would still need to keep the traditional Harley design. They decided to build a whole new bike.

Within this new bike, the team chose to include a liquid cooled engine that would allow for a faster bike but wanted to keep the cruiser frame. To analyze and design this new bike more efficiently the team built a clay model that would allow for a more versatile way of representing the designs. They included in this design a new exhaust that would be big enough while still maintaining the sleek Harley trademark. They included a double framed design made out of aluminum by hydroforming to minimize the number of welds both strengthening it and giving it a cleaner look. This clay model had more of a “dragster” look to it.

The team now had to generate these ideas into a real bike and test all of the prototypes. After designing the first real life bike, the team discovered that the exhaust was too loud and could not meet the noise standards required and they needed to fit a new water line that would assist in cooling the engine. Additionally, they had to redesign the gas tank as the new internal design left less room. The team tested the bike through a variety of hot and cold climates to test all aspects of the bikes built. They also had to come up with a way to make the bike idle more efficiently while still maintaining its durability and ability to withstand any amount of weather conditions. The team then also tested against electronic interference to make sure the bike could withstand these conditions.

After making adjustments and coming up with new ways to make the V-Rod more efficient, the team was ready to communicate their new bike to the world. Engineers and artists worked together to make sure this new final form of the bike could prove to be faster and still have the Harley touch to it. After designing for years, the team’s new tests proved that the final
V-Rod was not only faster but would be ready to be sold on the market. The release of the Harley Davidson V-Rod was then presented at the Convention.