The Harley Davidson V-Rod Motorcycle and the Engineering Design Process

Harley-Davidson recognized that they were falling behind. They needed a new model of cycles to beat competition to a younger generation of bike riders who were more interested in speed than style. They wanted to keep the loyalty of their old customers while appealing to a newer generation. Harley-Davidson did not want their technology to fall behind their competition.

The problem was that they needed to make the bike fast with a water cooled engine because a more powerful engine would produce more heat. Water cooled engines are larger than the air cooled engine they had used traditionally. The engine gave them speed but they needed to give the bike the style of a Harley Davidson Motorcycle

The design team, after being inspired by Harley’s superbikes and drag racer models, created a partnership with German car company Porsche to create a new kind of engine. To create a new type of solid steel body the engineering team would learn to use a new pipe shaping process called hydroforming.

The style team led by the vice-president of style at Harley-Davidson, Willy G. Davidson, drew up ideas for how they wanted the bike to look. They would also draw how they wanted the engine to look, these designs were sent to the team in Germany to develop the new VR-1000 engine. The teams would continue to collaborate to create both the design they wanted and the power they needed.
The engineering design team tried to integrate each other’s ideas into the final bike, with both teams compromising along the way both to make the bike stylish but also to make the bike fast and efficient.

The style team used clay to design the exterior stylings and the rough interior of the bike while the engineering team would contribute by attempting to fit the interworkings of the machine into the bike. They compromised on issues such as air intake valves and new plastic gas tanks.

The teams collaborated and created several prototypes of the engine and later the bike. These prototypes were put through rigorous stress and durability tests that made sure that the design was not susceptible to the elements. These included many tests in extreme conditions such as deserts, as well as tests that would go on for days on end. They also fine-tuned the amount of noise the bike made along while making sure that the bike sounded like a Harley-Davidson motorcycle. They had created a Harley unlike one they had made before, with both style and intense speed.

The bike was now ready for release to the public. Marketing would name the bike the V-Rod for marketing purposes. V for the VR-1000 engine and “Rod” as a reference to hot-rods. The company would announce and show off the bike at the 2001 Harley-Davidson Dealer Meeting where it was met with much acclaim.