Harley Davidson V-Rod Motorcycle

Harley Davidson faced a unique challenge in the mid-1990s. A new trend of motorcycles was emerging, and Harley Davidson needed to appeal to the new generation. They needed to create something new, but also keep allegiance of their original customers. Harley Davidson needed to combine speed and power in their new design to connect with the younger generation of motorcycle enthusiasts, but at the same time preserve their “Harley” style.

In order to create this new design, the experts at Harley Davidson began to research possible solutions to building a brand new motorcycle. The team of designers traveled to racing tracks to observe how the engines of the fast bikes were housed and how the bikes operated at such high speeds. The team found that these drag racing bikes contained strong frames and liquid cooled engines to keep them from overheating. Harley Davidson also consulted with experts at Porsche to figure out how to build a strong engine that had the lifespan of a consumer bike.

After doing research, the engineers at Harley Davidson decided to brainstorm several possible solutions to their challenge. The engineers began by creating an original frame that would be strong enough to house the engine. However, this frame was not appealing to the designers; the designers felt the frame would not attract customers. The engineers continued working with the design team in order to develop a frame that would satisfy both the designers as well as the engineers. The designers built a clay model of what they wanted the bike to look like. By using clay, they were able to better visualize the designs of all the parts on the motorcycle. The exhaust pipes held 12L of air – the biggest exhausts ever put on a Harley. The departments loved the clay model; however, it did not seem producible or practical to make into a real bike.

Harley Davidson worked constantly to develop a design unprecedented in their company history. The design team and the engineering team worked together to construct a frame design that was both attractive and structurally sound. This was the first of many compromises over the entire project.

Finally, the engineers began to create a prototype of the new bike with their newly designed frame and engine constructed with the help of Porsche engineers. The rest of the bike was a mix of the parts Harley wanted to use and parts that were fundamental for the prototype to work. The Harley team spray painted the prototype black to protect it from spectators and tested the bike on various roads. Upon testing the prototype, they found that the bike was undeniably fast and was able to handle the power of the engine.

Nevertheless, the bike still needed to be styled into a “Harley.” Problems such as air flow to the radiator, volume of exhaust pipes, and the size of the gas tank were evident. These issues posed significant legal problems such as noise regulations, as well as problems to consumers,
such as overheating. Possible solutions included putting scoops on the radiator to allow more air flow, using a plastic gas tank to mold it into the shape of the frame, and adding a secret chamber to the exhaust pipes to hold more volume. The team of engineers tested these solutions and found them to be workable.

After testing proved successful, the engineers took their ideas to the designers. The designers then accepted the new ideas and worked to style them into the bike. The next step was to get Willy G. Davidson’s approval for the design. After Willy G. Davidson took a test ride, he finally approved. However, there were still a few problems with the motorcycle. Although the design was satisfactory, logistical problems still remained to be solved.

To solve these last few problems, the team put the bike through a wide variety of tests. The bike was tested for heat resistance, engine durability, electronic interference, noise, water resistance, structural durability, and riding comfort. The bike was put through 500 hours in a simulator which provided various situations to test overall durability. Next, the bike was taken to Arizona Proving Ground to test the revolutionary engine as well as the strength of the structure. Here, the bike was ridden through a variety of road conditions including sharp turns, hills, potholes, and bumps.

At this point, the project was nearly complete. After years of continuous designing, engineering, testing, and collaboration, the bike was unveiled to the public at various conventions. Harley Davidson had managed to create a motorcycle with unprecedented design and capabilities. The new bike proved to be successful among the new generation, but also retained the classic Harley look and loyalty of the original customers.