In the case of the V-Rod, the engineers displayed the stages of engineering design. In order to justify the creation of the V-Rod design, engineers found a market pull from consumers wanting a high performance Harley. People started to prefer speed over style, but the engineers wanted to give them both. To do this they decided to replace the air cooled engine with a liquid cooled engine.

There were multiple problems discovered when designing the V-Rod model. The overall problem was maintaining the Harley Davidson style wanted by the design team and the performance wanted by the engineering team. For example, when incorporating the liquid cooled engine, the engineers had to redesign the frame of their typical Harley and branch outside of their comfort zone.

Engineers gathered information by observing their past designs, determining what their consumers wanted. The design of the dragster motorcycle provided inspiration for the design team. Moreover, they need to make the new design user friendly so that consumers could customize. With this information, they were able to brainstorm designs. One helpful medium apart from the computer program was to actually create a scale model of the motorcycle in clay which would make it easier to alter and present new ideas.

Both the engineering and design team created their own design of what they wanted the new model to be. They then compared designs and selected the best suited attributes to produce a
collective design. Once the drafting for the design was complete, they proceeded with the fabrication of the V-Rod prototype. After the prototype was formed, the engineers realized that there were many problems with the design. The engine, frame, exhaust pipes, radiator, and gas tank all presented a conflict. The complicated design showed that it was unrealistic to place the features where the styling team thought they ought to be. The original gas tank only held a small portion of the fuel needed for the motorcycle to perform for an extended period of time. Harley Davidson turned to Porche for help with building a more affordable, efficient, and powerful engine. Together the engineering teams came up with an idea that would meet both performance and styling standards. Although this was achieved, they realized that the frame of the bike would ultimately have to be altered accordingly. The exhaust pipes were also troublesome in that their shape and size were not meeting the performance standards. A third volume was then created to tie in two pipes to one to create a more efficient exhaust that also met environmental standards, like noise pollution. Furthermore, they needed to find a new position on the bike to place the radiator to prevent overheating, so they needed to find a place with better airflow. Finally, the bent design of the frame made it difficult to place such a large tank onto the bike. By using plastic, they were able to form the gas tank to the form of the bike, thus increasing the overall volume.

After the strenuous design process, each prototype made was put under certain tests to evaluate its performance. First, to disguise the motorcycle, they spray painted it black. Then to test the engine, they put it through the Audubon test. Secondly, they put the motorcycle in intense heat and water to test the durability of the components. To keep the true Harley sound, they performed a sound test to make sure that the sound maintained the traditional sound and noise pollution regulations. After a myriad of tests, they deemed the bike sufficient for use.
After multiple road tests and alterations a final prototype was designed. Both the engineering and styling teams were pleased. Lastly, the name. The name “the V-Rod” came from a compilation of the VR1000 engine and the Revolution. The final design was showcased at the Harley Davidson conference. The marketing team then took over to promote and publicize the V-Rod.