Newer, faster bikes were becoming available to consumers, so Harley Davidson had to create a new bike. They were challenged with creating a new bike that combined the speed and power of a racing bike while maintaining the Harley style. In order to keep their loyal customers, they constantly had to keep in mind the Harley style.

The main issue that the engineers faced was putting the VR1000 engine in a typical Harley frame. Because of the different type of engine, a large radiator to cool it was required. They took inspiration from drag racing bikes. The styling team created a design initially that the engineers had to work with. However, this design did not work. The engineers and styling team were constantly communicating and compromising about the look and function of the bike.

The styling team drew up a design with a small radiator that fit perfectly in the Harley frame. When the prototype was tested, it failed since it did not allow for adequate air flow. While in the wind tunnel, they had the idea to add scoops. Using what they had, they attached 2 pieces of a fed-ex box to the radiator which gave it better air flow. The air was still not being directed to the radiator; it was simply going in one side and out the other. They then added a vortex generator to redirect the air, allowing it to function properly.

The radiator was concealed in the front of the bike and the styling team approved of the design. The next step in the engineering design process was to test the prototype with the final design of the engine, co-engineered with Porsche. They ran the bike on several different simulators. The engine was ran for 500 hours and worked properly. They also ran it on a road condition simulator, which simulated the worst possible road conditions.
The engineers were continually testing and improving the bike during the seven years of the engineering design process. After all the tests were concluded, the new Harley was unveiled to the public.