

ZZR1400

A Look Behind the Scenes of the
Development of Kawasaki's Newest Flagship

Kawasaki
Let the good times roll.

Introduction

The ZZ-R1100 (Ninja ZX-11 in the U.S.) made a stunning debut in 1990 as Kawasaki's flagship model. Combining awesome performance with surprising all-round versatility, this big-bore supersport machine was hugely popular in markets around the world.

Impressive as the ZZ-R was, Kawasaki's reputation for building the most powerful production bikes in the world was established much earlier, with the release of the incredible Z1 (a.k.a. King of the Superbikes). In 1977, the Z1 was superseded by the Z1000, and followed by the Z1R, the Z1100GP and, finally, the GPZ1100 — each a landmark machine in its own right. In 1984, Kawasaki again set the performance standard with the all-new GPZ900R (Ninja 900R in the U.S.). This sleek, liquid-cooled machine morphed into the GPZ1000RX in 1986, then the ZX-10 in 1988, and culminated in the ZZ-R1100 of 1990. In 1993, the ZZ-R1100 got a full model change, and in 2002 was finally relegated to history by the release of the ZZR1200.

Big-bike Ninjas included the Ninja ZX-12R released in 2000 and, in the latest iteration of Ninja dominance, the Ninja ZX-10R of 2004. Today, the three pillars of Kawasaki's hyperbike triumvirate are the massively powerful Ninja ZX-12R, the track-bred Ninja ZX-10R and the supersport tourer ZZR1200.

Kawasaki riders take pride in knowing they're rolling down the road on the highest performing machines in their categories. To ensure that Kawasaki's reputation for unbeatable performance remains untarnished, we proudly present the new ZZR1400 (Ninja ZX-14 in the U.S.). The ZZR1400 will soon be followed by our next-generation supersport tourer, which was unveiled at the Paris Salon in the fall of 2005. The new open class king, the ZZR1400 is the latest in an impressive line of flagship machines from Kawasaki.



Development Concept

Before drafting the plan for the new machine, the ZZR's product planner carefully considered Kawasaki's three flagship models: the Ninja ZX-10R, the Ninja ZX-12R and the ZZR1200. As the quickest circuit bike, the top performance bike and the ultimate supersport touring machine respectively, these machines were the three pillars of Kawasaki high performance. Still, he felt something was lacking.

He knew that Kawasaki had to have an undisputed open-class king. Recognised as the world leader in high performance motorcycles since the 1970s, Kawasaki had not had a model with the presence to clearly appeal this fact since the ZZ-R1100. The new machine had to be both very powerful and stylistically avant-garde.

Says the product planner: "Even with our impressive 3-bike lineup, I felt something was lacking, as though our performance image was diluted across three different models. Putting aside for now the growing touring market in Europe, I wanted to offer all those hard-core ZZR fans in the U.S. and Japan, the quintessential fans who understand the core Kawasaki, something to get excited about — something big, bad and loaded with Kawasaki attitude. It didn't have to be the fastest, but it did have to be the most powerful, a flagship model, a new ZZR."

This is how the ZZR project got its start. The most important concept was top performance in the open class. Apex strafing could be left to the Ninja ZX-10R. The new ZZR would not only be the most powerful — churning out more horsepower than the mighty 10R — it would also be very comfortable. In other words, Kawasaki's engineers would sequence the latest evolution of the all-powerful ZZR DNA — the DNA of performance kings like the Z1.

Surveys were carried out in the three main markets for the new ZZR: the U.S., Europe and Japan. European riders wanted a touring machine with shaft drive and standard touring luggage. Americans' needs were simple: they wanted the fastest bike in its class. And the Japanese wanted heaps of undiluted Kawasaki attitude. Kawasaki decided on a mix of U.S. and Japanese qualities. Another model would have to satisfy the Europeans. In fact, a sketch of this advanced supersport touring model was shown at the Paris show.

The guiding theme for this new ZZR would be "the most powerful." Combining the superb comfort of the earlier ZZR's and a level of raw performance that would earn it the moniker "King," the new machine would have an unmistakable Kawasaki presence. This would be a motorcycle the likes of which the world had never seen.

The ZZR project leader states: "We all agreed that it was very important that the new ZZR express Kawasaki's premium brand image. That is, it must embody the Kawasaki DNA. Further, it must have an aura that distinguishes it from its rivals, in terms of both quality and style. Unlike the earlier ZZ-R1100, maximum top speed would not be a primary aim. Still, high performance would be the bike's defining quality. Our greatest challenge was how to express the three pillars of Kawasaki high performance in a single machine."



Styling

Engine and chassis development proceeded simultaneously, and studies were carried out for the new Kawasaki flagship. First and foremost, the design had to express the Kawasaki DNA, the image of Kawasaki as the performance leader.

According to Kawasaki's Design Planning Section Chief: "The Kawasaki brand has a hard-core image. This spirit is expressed by the speed, power, masculinity and dignity of our machines. For that reason, the new ZZR had to be a complete package with no weaknesses. In the big-bike category, Kawasaki is a premium brand. Serious Kawasaki fans pay particular attention to this class. The new ZZR must meet the demanding expectations of these serious enthusiasts."



Unlike conventional designs, the design studies for the new ZZR did not begin with sketches. An actual clay model was produced, and the designers and stylists continuously refined the model until the definitive shapes were achieved. Working with a 3-dimensional model rather than sketches, the small group of engineers and designers used a *carrozzeria*-style design process to achieve a tightly focused and very concentrated design. Like a living organism, the design evolved quickly on a day-to-day and even hourly basis. Step by step the basic design of the new ZZR began to take shape.



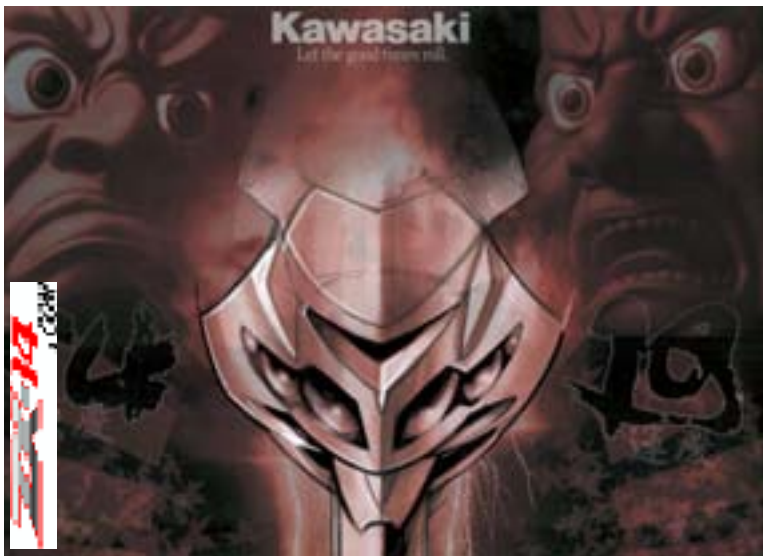
"There was a big difference between the model's early, mid-stage and final designs. The actual design process was quite long. Each member of the design staff had a clear idea what the new ZZR should look like, and that idea never lost its focus. As development proceeded, everyone shared a unified concept of what the bike should look like," says the Design Planning Section Chief.



Styling

The design theme for the ZZR called for a visually powerful image with a distinct presence, one that was intimidating rather than beautiful. When the chief designer saw the sketch for the new ZZR he coined the keyword “Menacing.” This was precisely the image that Kawasaki’s hard-core fans wanted.

According to the chief designer: “The area around the headlight is the key design element. Following the Design Planning Section Chief’s lead, we continued to develop and refine the design from that starting point. We created a clay model based on a sketch, then went to work shaping and moulding it. It took about two years from the start of development until the definitive form was achieved. And while the final shape is similar to what we started with, I think everyone on the design team will agree that the completed design perfectly expresses the bike’s dominating personality. During the design process we were always acutely aware that we had to live up to the expectations of hard-core Kawasaki fans.”



The new ZZR is not only all-new, its stunning design makes it instantly recognisable as a Kawasaki and shares a family resemblance to the Ninja ZX-10R and ZX-6R. In the words of the Design Planning Section Chief: “One of the first decisions we made was that, like the other machines in the Kawasaki family, the new ZZR should have a centrally located Ram Air intake. In the early sketches the bike bore a faint resemblance to the ZZ-R1100. It started out with three headlights, a central projector headlight flanked with multi-reflector units. At the time, we were also designing the Ninja ZX-10R, which had two projector lights and two position lamps, giving it a 4-lamp design, so we decided to use a 6-lamp layout for ZZR. It was all rather a spur of the moment inspiration. To give the bike a flagship presence, we wanted symmetry for both the low and high beam settings, so we used four lamps on low beam setting (two projectors and the position lamps) and all six lamps for the high beam setting. The 10R uses both position lights and one of the projection lights

on low beam, and adds the second projector lamp for high beam. It is important for supersport bikes to look lightweight when the headlight is on, and headlight design is very important in achieving this effect. And of course, headlight design varies significantly depending on the category.”

Styling

Headlight design was only one of the many styling themes. As a flagship model built for high-speed roadwork, airflow management was a major concern. Although the ZZR has very different proportions from the Ninjas, aerodynamic performance is just as important. And that's one reason the new ZZR shares a family resemblance with famous ZZR's of the past.

"Motorcycle design is all about expressing movement," says the Design Planning Section Chief. "We wanted the new ZZR to have a different stance than that of the 10R, a kind of crouching stance, like a lion about to spring. The design is defined by a sharp line running from the front wheel to the tail cowl. And while the parts themselves have volume, the overall image is of lightness. Thus, even though sharp lines are used, the sense of volume remains undiminished. Although the centrally located air intake and the Z-style air outlets at the side of the cowl give the bike a family resemblance to other machines in the Kawasaki family, the design is completely new."

The distinctive louver lines at the side of the cowl direct the heated air from the radiator efficiently into the air stream flowing past the machine. The same "edgy" line is also expressed in the design of the front fender, mirror stays and footpeg plates. Everything about the ZZR's form expresses its high-speed touring potential. Even the sharp-edged tail cowl is designed to comfortably accommodate the legs and hips of the tandem passenger, keeping them out of the flow of air. After all, a true flagship model must be as comfortable for the passenger as for the rider.



"The design went through various permutations before being finalised," says the ZZR's product planner. "And while we wanted to retain that unmistakable ZZR image, it was also important to allow the image to evolve. Throughout the design process, I had a very distinct idea of what I wanted the bike to look like, and that image remained clearly in focus throughout the design process. I think the design of the new ZZR will exceed the expectations of Kawasaki fans in Japan and America. From both an aesthetic and functional viewpoint, this is a very well balanced design."



Basic Layout



The first step in the new ZZR's development was determining the engine's displacement. As a successor to the ZZR1200 — and considering the competition in this now hotly contested class — Kawasaki chose an engine size of 1,352 cm³, the largest displacement ever for a Kawasaki sports model. To be able to control the awesome power of the new engine, we mounted it in a more advanced version of the aluminium monocoque frame first featured on the Ninja ZX-12R. Offering the most powerful engine in its category mounted in a highly sophisticated chassis, the new ZZR is truly a next-generation supersport tourer.



The ZZR's chassis designer says: "Above all, we wanted the bike to have very well balanced handling qualities. The new monocoque frame uses lighter castings and is simpler in construction than the Ninja ZX-12R's frame. By controlling the wall thickness of the castings we were able to achieve an ideal balance between strength and rigidity. The ZZR's frame is 1.5 kg lighter than the 12R's."

Thanks to new construction methods, not only is the new ZZR's aluminium monocoque frame lighter than the 12R's, its longitudinal, lateral and torsional rigidity are all improved. The ZZR Series

machines are known for their excellent handling qualities. When developing the new frame, the chassis engineers wanted to take these handling qualities to the next level.

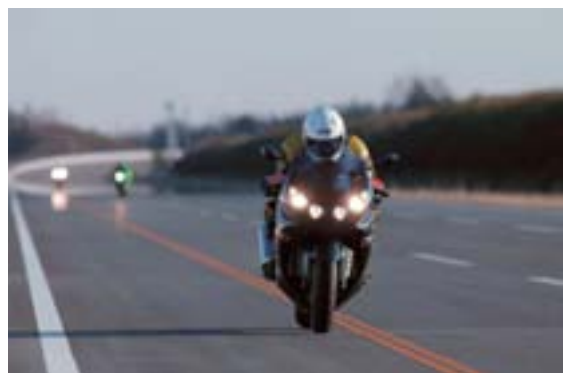
Basic Layout



“The last ZZR was a big bike weighing over 200 kg,” says the ZZR project leader. “But its responsive handling qualities made it feel like a much lighter machine. In spite of their big look and unmistakable presence, the ZZR’s excellent handling qualities have made them very rider-friendly bikes. At speed on the highway, the ZZR’s combine superior straight-line stability with the responsiveness needed for quick lane changes and for negotiating crowded city streets. These qualities have always been part of the ZZR DNA, and we were determined that the new bike would share these excellent traits.”



The chassis designer adds: “We performed exhaustive testing to achieve the handling qualities we wanted. Although computers were used extensively in the chassis’ design, when it comes to interaction between bike and rider, there are some qualities that only the test riders can sense. And of course, as an aircraft manufacturer, Kawasaki has extensive experience in using high technology to create an intimate relationship between men and machines.”



However long the journey, it begins with a single step. So it was with the development of the ZZR1400.