

# Styling Design of CBR250R

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## ABSTRACT

The CBR250R was developed as a top-end model for the rapidly growing motorcycle markets of Southeast Asia and India and an entry-level model for the mature markets of Japan, North America and Europe. This development was undertaken under the banner of offering more customers one of motorcycling's attractions, namely the "joy of driving." The model has been launched in 22 countries as a motorcycle with a "sporty full-fairing exterior," the "joy of operating" and a "reasonable price."

With a model concept during development of "sports quarter for one world," design proceeded on several fronts, including concept and determination of specifications. The purpose was to develop a package that is lightweight, compact and easy to handle so that sporty cruising is enjoyable, and to do it all with globally common styling at a reasonable price.

Carrying on the styling theme of "mass concentrate proportion" that underlies Honda's sport motorcycles, designers from Japan, Europe and Asia discussed the styling that evolves to fit the times, and working together, they created such a styling.

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## 1. Introduction

The CBR250R is a top-end model in Southeast Asia and India, where there is marked growth in the market for small-sized motorcycles in the 100 cm<sup>3</sup> – 150 cm<sup>3</sup> class. Its role is to develop new markets for users who want not only the "pleasure of driving" but also the "joy of ownership." A simultaneous role is to invigorate the more mature markets for motorcycles in Japan, North America and Europe as an entry-level sport model.

Thus, the issue in developing this model was to meet the market needs of vastly differing parts of the world and bring a single concept and a single styling into a global sport model that is a standard around the world.

This development was undertaken under the banner of offering more customers one of motorcycling's attractions, namely the "pleasure of driving." The development targets were to provide an expression of "sporty styling that gives the customer the joy of ownership," as well as to achieve a pleasure of operation that "anyone from beginner to experienced riders can enjoy" and a wide range of user friendliness that "accommodates everything from city cruising to sporty touring."

In the development of this model, it was assumed that the production would be done in Thailand where high quality yet low cost production for a 250 cm<sup>3</sup> sporty model could be achieved. Therefore, all departments concerned, such as development, marketing, production, procurement and service, collaborated on development from the

planning stage.

The CBR250R was launched in 22 countries in November 2010 and has been favorably received in them all (sales in Japan began in March 2011).

## 2. Concept

At the early stages of planning, Honda began a study with the grand purpose of developing markets for sport motorcycles of 250 cm<sup>3</sup>, the largest engine class in the markets of Southeast Asia and India.

Starting with the assumption that the target user was a sports-oriented male in his 20s or 30s seeking an upper-end motorcycle, the study members took the customer's point of view to answer the question, "What product values must this model have to appeal to this user?" As a result, they determined that in order to embody the development targets, the characteristics of this model would be a "full-fairing exterior" that is sporty and gives the customer the joy of ownership, a pleasure of operation that anyone from beginner to veteran riders can experience, and a "high-torque single-cylinder engine in a lightweight, compact body that is easy to handle" to ensure user-friendliness for everything from city cruising to sporty touring. An additional objective was to achieve the satisfaction for wide range of customers making it our top-end model for the part of Asian market while keeping easy handling as an entry-level model as well.

As for the price, although it would be situated in the

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higher price range in the markets of Southeast Asia and India, Honda researched the purchasing power of the target users and set a proper price accordingly.

In the process of establishing the basic specifications, the marketability has been evaluated closely for the markets in other areas but Southeast Asia and India, such as Japan, U.S. and Europe where the sporty motorcycle category market has been already matured, to examine the product validity in the market as a full-faired sporty entry-model with attractions of reasonable price and high quality. This investigation had been concluded to find that the model had the potential for developing a market with many entry-level customers and the decision was made to start the development. Thus, development for the global market ultimately began with the model concept of “Sports quarter for one world.”

### 3. Package Design

The development team had a strong desire that “We want people to enjoy motorcycles with their sensations, regardless of their traffic environment or differences in physical sizes.” To realize this desire, we had set several design criteria that had something to do with functional performances. One of them was about the shape of cowlings that could accommodate a variety of riders ranging from Asian riders with smaller average height to Western riders with larger average height. The second criterion was about the maximum steering angle to get the minimum turning radius that satisfied good handling for light-weighted and compact body while considering good maneuverability suited for both city cruising and sporty driving. The third criterion was about riding posture which is to be upright posture to the vehicle (Figs. 1 and 2).

However, a steering angle that meets these functional requirements, in other words, one that ensures user-friendliness in the city, and the steering handle shape that provides an upright riding position, were expected to

significantly limit modeling freedom of critical elements that are the very essence of full-fairing styling, especially the low, momentarily-striking proportions of the upper cowl and the relaxed character of the middle cowl from front to back.

Therefore the team conducted the configuration studies with 3D virtual models to determine the basic dimensions (Figs. 3 through 5). This also made it possible to match the arrangement of auxiliary equipments and wiring around the

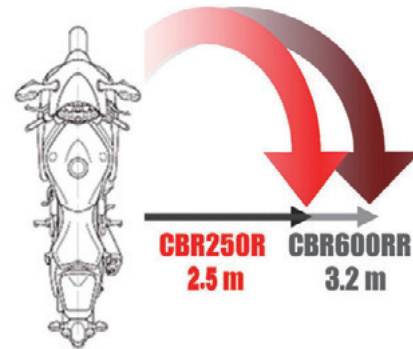


Fig. 2 Minimum turning radius

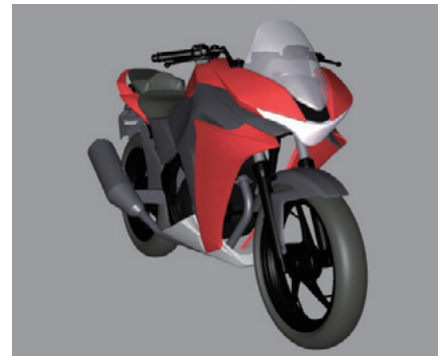


Fig. 3 3D model: Front quarter view



Fig. 4 3D model: Overhead view

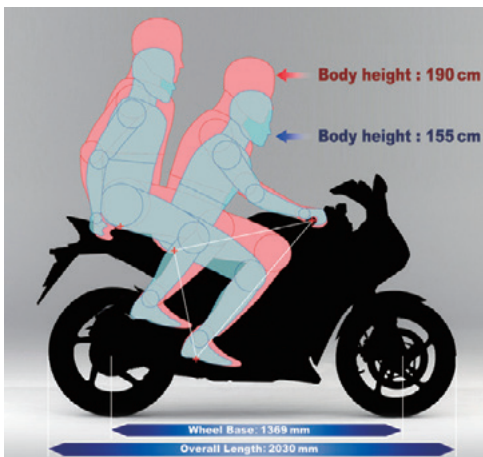


Fig. 1 Riding posture (body height: 155-190 cm)



Fig. 5 3D model: Gauges and switches

steering handle with the outlines that appeared in the design sketches at an early stage.

Such prior simulations enabled the team to find, in advance, places where modeling limitations existed, helping to identify the possible increase in the degree of freedom for examining styling.

#### 4. Styling Design

Design work for the CBR250R started with the goal of creating a benchmark for middle-class sport models, with basic proportions that provide a strong sense of Honda sport model identity together with modern styling.

First, “mass concentrate proportion,” which has been a basic theme of Honda’s sport category styling since the RC211V, an HRC racer that debuted in 2002, was chosen for the main keywords (Fig. 6). Next, the design techniques of “multiplex structure” and “sculptural surface,” which were used in the VFR1200F<sup>(1)</sup> and CBR1000RR developed in 2008, were chosen as sub-keywords, and then the styling examination began.

Specific design techniques referred to by these keywords are described below.

**Mass concentrate proportion:** A design technique that puts heavy parts like the engine, and the exterior parts that cover them, in the center of the layout and makes the overall proportions compact.

**Multiplex structure:** A design technique that enhances functionality and provides visual novelty by giving every functional components of cowling (air deflectors, air regulators and heat exhaustion components) an expression of shapes as separate components, and by overlapping them when building the overall outlines.

**Sculptural surface:** A technique with which models are created just like the ones by sculpting with boldly chiseled surfaces from a larger mass, emphasizing large modulation and deep clear cuts.

##### 4.1. Pursuit of the Styling Concept, and Sketch Collaboration among Designers from Research Labs in Various Countries

In developing the sketches for this model considering

the differing positioning in those markets, as noted above, the design team had two opinions: to proceed with a focus on the “high-class look and status of the VFR” as a top-end sport motorcycle model, or, instead, to focus on “the youngest brother of CBR series with the entry-level sporty image” as one of the super sport models (Figs. 7 and 8).

The size and external design of a motorcycle vary greatly depending on its purposes and how it is to be enjoyed, such as models intended for long-distance travel on a highway, and those for a driving in a circuit. The aforementioned VFR1200F was designed with a large cowling to provide traveling comfort to minimize fatigue for cruising long distances at high speed, as well as to bear the image of property of a matured adult.

The CBR1000RR, on the other hand, was designed to be lightweight and compact and express simplicity and a sense of condensing everything into the center of the body, primarily so individual riders could enjoy sport cruising.

In the current model, the team considered visual elements that satisfy customers’ desire to own a motorcycle (such as the high-class look and status that come from the coloring and a form that has modulation and a sense of presence, as in the VFR1200F) to be necessary elements for a top-end model in the Southeast Asia and India markets.

On the other hand, it was also to be a highly universal entry-level sport model as the youngest brother of the



Fig. 7 2010 VFR1200F



Fig. 8 2010 CBR1000RR

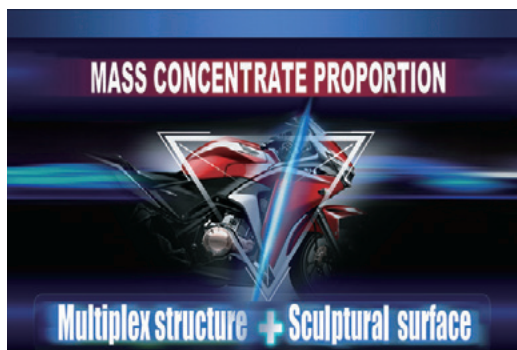


Fig. 6 Styling concept

CBR series, and therefore the proportions, which are basic to styling, were set according to the main keywords “mass concentrate proportion” (in other words, everything appears condensed into the center of the body), to preserve the simple and decisive styling of a super sport motorcycle.

This fuses two styling elements – “a form that has modulation and a sense of presence” and “simple and decisive styling” – that at first glance appear contradictory to each other, and finding the optimal solution to this was seen as the main modeling issue.

The design team, which brought together designers from research centers in Japan, Europe and Asia to solve the above issue, developed the sketches.

In response to the above issue, the designers’ differing cultural backgrounds enabled them to express their individual ideas in sketches, and allowed them to expand their scope of styling expression in trying to create something original while simultaneously inheriting the image of higher-level models.

The European proposal (Fig. 9) and the Japanese one (Fig. 10), which survived into the final round of considerations, each expressed the CBR Series’ sense of condensing everything into the center of the body, and at the same time divided the functional parts of the upper, middle and lower cowls into independent elements, giving an expression of visual novelty with the nimbleness of a sport bike. The process then went to the final sketch based on these two proposals.



Fig. 9 Concept sketch from Honda R&D Europe



Fig. 10 Concept sketch from Honda Motorcycle R&D Center Japan

#### 4.2. Final Sketch Development

In the final sketch, there was an awareness of the high-class look and status that were lacking in the previously mentioned sketches. The surface’s modulation and stress, and the continuous transition between sharp, hard forms and soft forms, express tension and change in the overall form.

The surface that extends from the tank, with which the rider has direct physical contact, to the middle cowl comprises continuous surfaces that are organic and modulated; in contrast, the section from the front cowl to the middle cowl, which regulates the air stream, is made to appear bold with simple, large surfaces. A major characteristic in the design of this model was the respective use of these surfaces with different characters and their fusion into a single form.

Moreover, the undercowl (which covers the exhaust pipe and the engine that produces great heat) is continuously connected to the muffler cover. This helps to cool the engine area and forms a configuration of hard, mechanical surfaces, so that the area is expressed as if it were part of the engine components and the nimble overall look is enhanced.

The result is that the high-class look that gives the customer the joy of ownership and the nimbleness of a sport model have been packaged together in a single form (Figs. 11 and 12).



Fig. 11 Final sketch: side view



Fig. 12 Final sketch: front view and rear view

### 4.3. Functioning Parts

#### 4.3.1. Engine design

The 250 cm<sup>3</sup> water-cooled DOHC single-cylinder engine with next-generation environmental and power performance combines a simple, non-affected side view and modeling around compact but powerful cylinder heads.

Moreover, the black metallic paint emphasizes a bold exterior that projects functional beauty (Fig. 13).

#### 4.3.2. Meter design

The design of the meter and indicator area is sporty and functional. The analog tachometer is placed in the middle of the instrument panel, and when the ignition is turned on, its needle sweeps all the way to full. As the needle returns, the liquid crystal speed display counts down along with it so the rider can make sure there are no irregularities in the meters.

To give the area a functional and modern expression, silver garnish with geometrical and mechanical styling is placed around the liquid crystal display and indicator area and the blue liquid crystal backlight adds to the effect (Fig. 14).

#### 4.3.3. Headlight design

To express sportiness and a unique look, the main reflector was extended to be shared with the position lights and the lighting was arranged in a Y-shape, creating a feature of the front view.



Fig. 13 Engine sketch



Fig. 14 Meter view sketch

Also, the surface slanting from the screen is driven toward the back of the vehicle body like a person drawing his chin downward, avoiding visual weight around the front.

Moreover, the inner lenses that covers the position lights emphasizes the Y-shaped character of the overall lighting, expressing a mechanical and high-precision luxury feel (Figs. 15 and 16).



Fig. 15 Front view



Fig. 16 Front quarter view

## 5. Color Design

The configuration of the exterior components of the CBR250R was innovated to allow two color variations that project very different images, allowing the model to suit the color preferences of a wide range of areas. There are many models of motorcycles with characteristic paint patterns, so color is a very effective means of differentiation.

In the example of Fig. 17, though the overall form is a simple structure, with the use of a chic monotone color emphasizes the middle cowl's organic and modulated continuous surfaces that extend from the tank. On this basis, this is the model chosen to express a high-class look and status as the successor to the VFR image, targeted at Southeast Asia and India. Figure 18, on the other hand, shows the result of combining bright and sporty tricolor



Fig. 17 Monotone color



Fig. 18 Tricolor

paint with the sharp wing pattern stripe that directly inherits the image of the CBR Series. This expresses the simple and nimble sport model that is sought in Japan, North America and Europe.

## 6. Conclusion

During the development of the CBR250R, the following techniques were used to deal with the design issue of determining one styling that meets the needs of different areas with completely different markets, fusing a flagship sport motorcycle for Southeast Asia and India with an entry level sport model for Japan, North America and Europe.

- (1) For the package design, 3D virtual models and other techniques were used to achieve both an upright riding position and low, momentarily-striking full-fairing exterior, allowing riders to experience the pleasures of motorcycling regardless of differences in transportation environments and body types.
- (2) For the styling design, the team fused two styling elements – “a shape that has modulation and a sense of presence” and “simple and decisive styling” – that initially appear contradictory, and packaged the high-class look that gives the customer the joy of ownership with the nimbleness of a sport bike in a single form.
- (3) For the color design, the configuration of the exterior components was innovated to allow two variations – a monotone color that emphasizes a high-class look and

a sporty color that is sharp and nimble – to ensure the model would suit the color preferences of a wide range of areas.

Through these design developments, Honda achieved its original development goals, namely “a sporty full-fairing exterior that gives the customer the joy of ownership,” “a pleasure of operation that anyone from beginner to veteran riders can experience” and “a wide range of user-friendliness that accommodates everything from city cruising to sporty touring.”

## Reference

- (1) Kishi, T.: Styling Design of VFR1200F, Honda R&D Technical Review, October, 2010, P. 15-19

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