

Styling Design of CBR250RR

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ABSTRACT

The CBR250RR had been developed as a new 250 cc super sports model. This model targeted Indonesia where the motorcycle market of 250 cc or larger engine displacement models is being activated, as well as Japan where 250 cc motorcycle category has been established and matured. In designing this model, the basic concept was set as “Attractive styling,” “Attractive equipment” and “Attractive performance,” which are realized by its feel of presence, design and equipment that do not look inferior compared to larger motorcycles. Under this concept, we set the keyword “Speed Shape” to the designing of its styling. In order to realize that, the design team and the vehicle development team repeatedly studied from the early stage of development, and we designed it starting with the layout of the basic skeleton. In addition, this “attractiveness” was defined as the foundation of the concept in coloring as well, and five types of color lineup were prepared individually responding to a variety of customers’ preferences. Through these styling designs and coloring we achieved the desired design goal of “attractive styling.”

1. Introduction

The CBR250RR is a new motorcycle model developed by Honda as a 250 cc super sports model (Fig. 1). The name CBR250RR was once used in a road sports bike released in Japan in 1990 (Fig. 2). Speaking of CBR250RR at that era, it was a model having advanced equipment and cutting edge sporty design, and was a motorcycle that young people eagerly longed for. What inherited from this model is not only the name. The vehicle design concept of “Super sports CBR250RR worthy of being admired” itself has also been inherited.

Along with the transitions in time for a quarter century since 1990, there have been major changes in motorcycle markets on a global scale. One of those changes is the increase in sales of large motorcycles of 250 cc or more in Asian countries where people’s economic power has been enhanced. Notably in Indonesian market, where a large motorcycle market has been growing vigorously, an authentic road sports bike of 250 cc displacement has begun to be sought, especially by wealthy young group of customers.

As for the Indonesian traffic environment, it is chronically congested in city areas such as in Jakarta and it is usually experiencing flooding on roads in rainy season as well. As a means of traveling in such an environment, the mainstream motorcycles are commuter motorcycles such as scooters. At the beginning of the development of



Fig. 1 The CBR250RR

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this model, a market research was conducted in Indonesia to clarify why the sales of motorcycles having an engine displacement 250 cc or larger increased in recent years in spite of the aforementioned circumstances.

First, we visited high-class shopping malls in a big city where large motorcycles congregate, and we surveyed the riders gathered here. They are young wealthy people living in a large city, and when the traffic decreases at night, they gather on high-class shopping malls and cafés with friends by motorcycles. They are the members belonging to such a motorcycle community (Fig. 3). According to information from them, there are many such communities in Indonesia in metropolitan areas. Their behaviors are to arrange their own motorcycles side by side for boasting of in a prominent place, to enjoy conversation, and, afterwards, to flow down the streets of the night.

From the interviews and other surveys, the difference in attributes was clear between the users of commuter type motorcycles, such as scooters, who are judging the value

based on the practical usability and the users who find values in self-expressions and pay money for it.

In developing a new authentic 250 cc super sports model, it was a clear task to aim for a styling and equipment with a sense of presence that is never ever inferior compared to large sports motorcycles. In order to meet the demand those customers make, we adopted advanced and attractive equipment such as Throttle by Wire (TBW), which was first adoption in this vehicle class, and Accelerator Position Sensor (APS). In addition, it was aimed to create a product that meets user needs at the high level, by applying equipment and vehicle grade beyond the class, such as inverted front forks and aluminum swing arms, which are usually adopted in large sports motorcycles.

The direction derived from the results of these market surveys was the realization of a motorcycle highly characterized for satisfying the desire of showing off (boasting of) their motorcycles that can adequately show the attractiveness, presence and value when they show their motorcycles in the gathering places. As the concepts of the vehicle, three of them, which are “fascinating styling,” “fascinating equipment” and “fascinating performance,” have been established.

In these vehicle concepts, the term “fascinating” is commonly used. Meanwhile, many Japanese users have experienced riding various 250 cc class motorcycles so far and are familiar with this class of motorcycles. We thought that this sense of value, i.e. “fascinating,” could get empathy from such users in Japan too, and we have been confident that it is a concept common to both Indonesian and Japanese markets. With that confidence, we promoted the development. In this paper, we will mainly describe the “fascinating styling” that is one of the development concepts of this motorcycle.

2. Fascinating Styling

“Attractive styling,” which is one of the vehicle concepts, refers to styling that stands out enough for showing off. That is, the targeted styling is the one that can make the viewers of the vehicle feel “he or she is riding an amazing motorcycle.” However, when considering “showing off” a motorcycle, the points to be presented as a unique property and features of each motorcycle will be different depending on what category that motorcycle belongs to. The points to be appealed for “showing off” ought to be different between, for example, such as a tourer type motorcycle with luxurious equipment (Fig. 4) and an American cruiser type motorcycle (Fig. 5) with beautifully shining chrome plating. As for a motorcycle in the category of super sports type (Fig. 6), first priority is given to the looks of being able to run fast regardless of who see it. Furthermore, it is important to make the viewer intuitively recognize its presence and value.



Fig. 2 The CBR250RR, 1990 model



Fig. 3 Riders of motorcycle community



Fig. 4 Example of tourer type motorcycle with luxury equipment (GOLDWING)



Fig. 5 Example of American cruiser type motorcycle (VT1300CX)



Fig. 6 Example of super sports type motorcycle (CBR1000RR SP2)

3. Styling Keyword - Speed Shape -

Super cars were the first thing imagined as the most easy-to-understand example of “attractive style” to satisfy target user’s requirement for “showing off.”

Even when it is stationary, it engenders the appearance of having potential performance hidden within, and from its posture, it emits the atmosphere that it could run fast. Based on the features thus defined, the styling keyword was determined to be “Speed Shape.” Figure 7 shows the concept board of the styling design to help them understand the keyword with images.



Fig. 7 Concept board of “Speed Shape”

4. Deepened Approach for Styling Design - Efforts for Defining from the Basic Skeleton -

The word “Styling” used in this study is a process of designing for the outline enclosing the interior. In addition, elements which influence the proportions in the outline are regarded as the factors involving in the basic skeleton.

This styling keyword “Speed Shape” evolves into wedge shape, which is one of the typical examples of shape forming expression for, so-called, sense of speed. In order to achieve that wedge shape, having the front nose postured low and the tail elevated high is important (Fig. 8). In order to realize that, it was necessary to step on the basic skeleton (Fig. 9), such as the arrangement of each functional part, the mounting position of the engine and the frame enclosing them.

In many cases, in the process of a development thinking of achievement of the target performances, when styling design is to be worked on, the approximate skeleton with basic layout is already determined, or the skeleton of the other base model is to be applied. In order to realize “Speed Shape,” we thought that the entire development team, including the designers responsible for functions and performances and the test riders, needs to deeply engage in the design of the basic skeleton

We decided to start our styling design work from the basic skeleton, as it greatly affects the proportions in vehicle outline.

Over so many hours, intense discussion was conducted by the team members on the subject regarding seeming to be fast even when it is stationary. Simple questions were asked to all the team members, such as “What is the shape that makes us feel it start to move at the next moment?” or “What is the form that makes us feel the potential to run fast?”

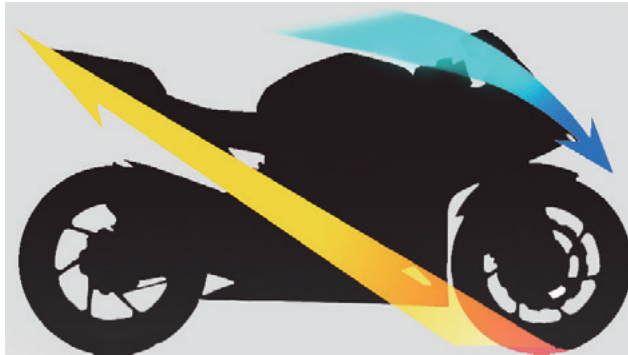


Fig. 8 Image sketch illustrating front nose postured in downward direction and vehicle tail leaping up high

The experience of sharing ideas regarding the styling design among the members, through these simple question-and-answer dialogs, contributed a lot to our process of development.

Many idea sketches were examined for the basic skeleton of the body frame structure (Fig. 10), and the best arrangement that provides required functions and



Fig. 9 Computer graphic of body structure skeleton

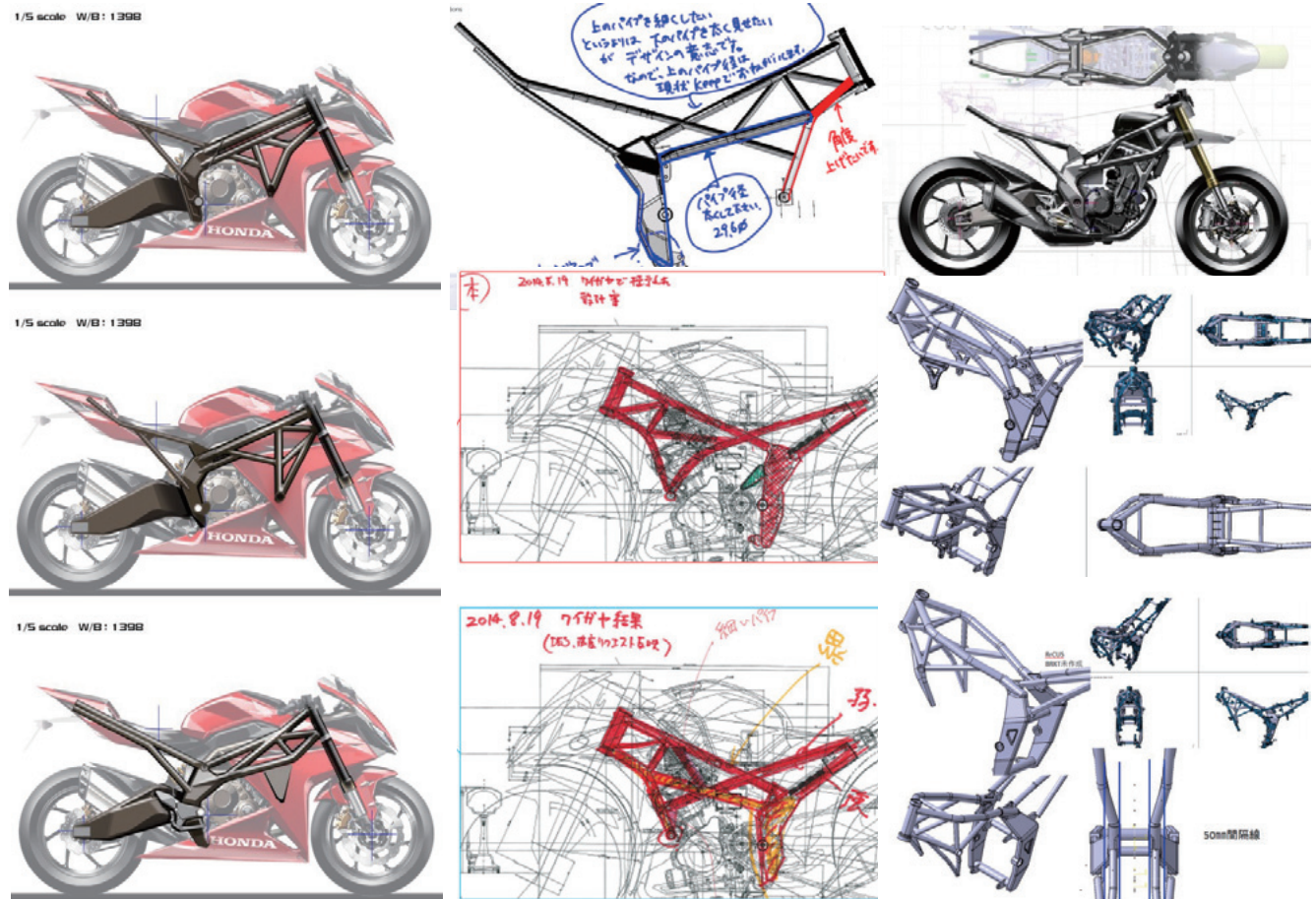


Fig. 10 Conceptual sketches for formulating frame composition

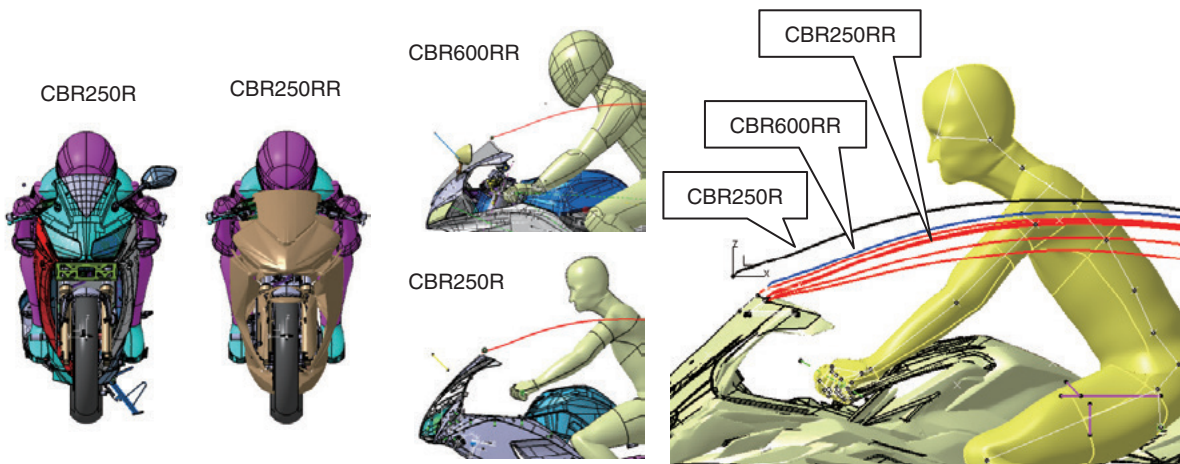


Fig. 11 Investigations through graphics drawn by conducting various analyses

performances of each part was decided utilizing CFD analyses (Fig. 11). The design approach involving all development members contributed to the achievement of the desired styling design creation that was aimed at in the initial stage of the development fostering strong teamwork, overcoming various hurdles experienced through in the process of the development.

With this basic skeleton, we developed an exterior design plan that conforms to the styling keyword “Speed Shape.”

5. Sketching

Styling sketches were drawn to express “Speed Shape.”

Attempts were made to achieve the target “the shape that looks fast even when standing still.” Considered were the styling design options hinting at motions such as the crouching start style that looked just about to leap, the stout wheel and suspension design as if they grabbed the ground surface and kicked the ground strongly to move forward.

The motorcycle in the super sport category, which is also enjoyed on race tracks, is such a vehicle that moves forward while ripping the air and clearing the corner while leaning the motorcycle from high speeds. Accordingly, the dynamic performance at the time of cornering was also taken into account in the styling design in addition to the wedge shape that rips the air. In that design method, studies were conducted for each of the fast-looking functional components, as well as for the fast-looking silhouette.

5.1. Fast-looking Functional Components

5.1.1. Importance of functional components as a design element

Studies were conducted on what kind of things were perceived fast to visualize the invisible “speed” when the motorcycle is standing still.

To begin with, studies were conducted on the MotoGP

racing machines, the pinnacle of high speed motorcycles, and the super sport models of 600 cc and 1000 cc.

In addition to the impression from the appearance with cowling, the impression of the motorcycle when stripped was also studied. In those studies, we have reached to such a conclusion that the “fast” image of the motorcycle is created by the strong appeal of the functional components directly linked to the running performance. The basic structure is composed of the wheel and suspension components that give an impression of high stiffness, the frame body calculated to deal with various forces acting on the vehicle body, the aluminum parts to attain both lightness and strength, etc. Such functional components are a significant element of appearance that gives natural image of high performance even when not actually working.

It was therefore considered also in the development of CBR250RR that appealing of high performance functional component was an indispensable element to achieve a fast-looking styling design.

5.1.2. Designing of functional components

All the components composing of a motorcycle are a functional part having a specific role of its own. Among those, especially the frame body and the suspension parts such as the front fork and the swingarm are the key items for running of the super sport model. In this model, we aimed designing of such functional components at achieving a sense of integration with the vehicle body, and giving such an image of powerfulness that kicks the ground when standing still along with agility by aligning the swingarm upper end line with the mainframe line. The details of designing are explained in the latter chapters.

5.2. Fast-looking Silhouette

As the next step, we studies on the silhouette common to something fast.

The following design elements have been selected for

each of the one having a high maximum speed (Fig. 12), the one having an image of acceleration (Fig. 13), and the one having an image of strong traction that supports them (Fig. 14).



Fig. 12 Example of object that recollects image of highest speed



Fig. 13 Example of posture that gives feeling of instantaneous power enabling acceleration in a moment



Fig. 14 Example of powerful body posture that gives impression of legs grabbing ground and kicking out forward

5.2.1. “A shape ripping the air” – Image of maximum speed –

A silhouette having a long, pointed end permits representation of something running fast ripping through the air. In other words, the silhouette of something like a sharp knife that rips air with a blade gives the viewer an image of something running at a high speed.

Such a silhouette is referred to as “long nose silhouette.”

5.2.2. “A shape impressing explosive power that causes instantaneous acceleration” – Acceleration image –

The silhouette with the head down and gazing at the front allows expression of speed more than the silhouette after starting running. In other words, the shape just before the release of accumulated power to run allows the viewer to imagine the speed hidden inside and the explosive acceleration at the following moment. Such a silhouette is referred to as “crouching style.”

5.2.3. “A strong silhouette in that the feet grab the ground and kick the ground to leap” – Image of traction –

To induce an explosive acceleration and a speed that rips the air, it is necessary to grab the ground firmly with the feet and have a traction that kicks out the object. In other words, it is necessary to emphasize presence of the wheels to express “Speed Shape.” As the motorcycle body is relatively downsized to emphasize the undercarriage parts such as the wheels, which symbolize traction, the form of motorcycle naturally becomes trapezoidal. In that manner, a strong silhouette in which the feet grab the ground and kick out forward can be created. We refer this silhouette as “trapezoidal form.”

In addition to the importance of image of the earlier mentioned functional components, the following three were taken as the key words to visualize the concept of “speed,” and sketches were drawn accordingly.

- Long nose silhouette
- Crouching style
- Trapezoidal form

These were incorporated into the sketches as the elements of “Speed Shape.”

5.3. Incorporation into Sketch

5.3.1. Long nose silhouette that rips the air when running

Studies were conducted on how to express the stretchy, sharp silhouette ripping through the air within the limited length of the wheel base. Figure 15 shows the idea sketch in the early stage. The sharpness that looks accelerating while ripping the air is expressed by boldly incorporating the sharp air outlet duct (A) that is long in the fore and aft direction and as if ripped with a sharp knife. The line (B) stretching along the duct from the nose to the rear end of the under cowl further emphasizes the sharp line of the

air outlet duct, and expresses the stretchiness of the entire motorcycle. The line (C) from the shoulder to the middle cowl as if paired with other lines further impresses the earlier mentioned two lines, and contributes to such an image that rips everything that confronts.

5.3.2. Crouching style that impresses explosive force that brings about instantaneous acceleration

To express the crouching style, the sketches were drawn using the same lean-forward triangle (Fig. 16) that forms the basis of the styling design of CBR1000RR.

It was perceived from the said studies that while the targeted crouching style was expressed, more emphasis of lean-forward posture was necessary at this time to impress the potential of explosive force. Accordingly, it was decided to emphasize forward tilting by forming a more upright triangle that integrates a part of the front wheel. Moreover, the rear cowl section is laid in such a manner that allows clear recognition as another triangle that makes the viewer perceive a form in the same direction as the other triangle (Fig. 17). By emphasizing the up-lifting image by the contrast of the two triangles, and adequately shifting the

visual center of gravity to the lower front of the motorcycle, the posture as if accelerating instantaneously has been represented.

5.3.3. Strong trapezoidal form in that the feet grab the ground and kick to jump forward

The compactness of the upper part of the motorcycle to realize the “trapezoidal form” as shown by Fig. 18 significantly contributes to emphasize the wheels and the suspension. However, it weakens the image of “powerfulness,” which is another element to express the speed potential. The “powerfulness” signifies strong aura and presence that push aside others, and is indispensable to impress overwhelming speed.

To express the “powerfulness,” the center of the motorcycle composing of the middle cowl and the fuel tank is rendered as an integrated mass. This strong massiveness serves as an expression of powerfulness that pushes aside others. Also, while increasing the volume of the pivot plate in the center of motorcycle, the sharp-edged shape is applied to the end of the front cowl, middle cowl, and rear cowl that connect to the pivot plate

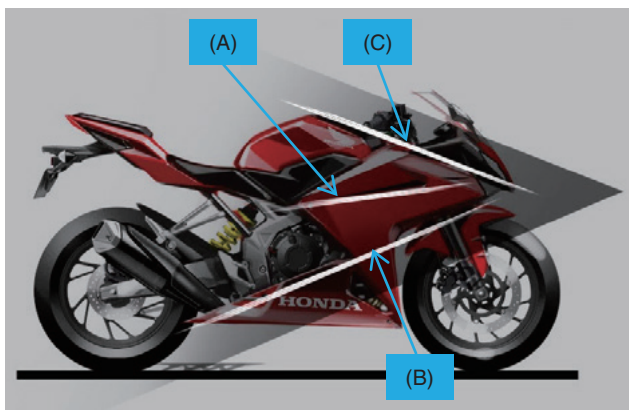


Fig. 15 Illustration of lines emphasizing long nose silhouette

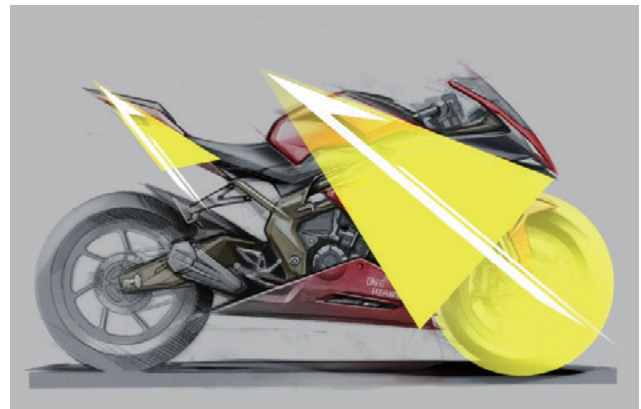


Fig. 17 Two triangles demonstrating form directed in same direction, which enhance forward slanted posture

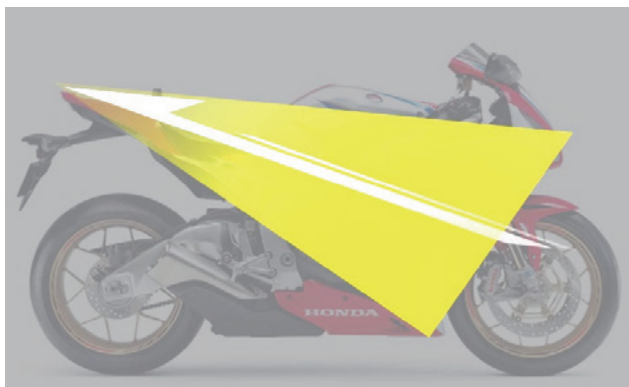


Fig. 16 Styling form symbolizing forward tilting triangle

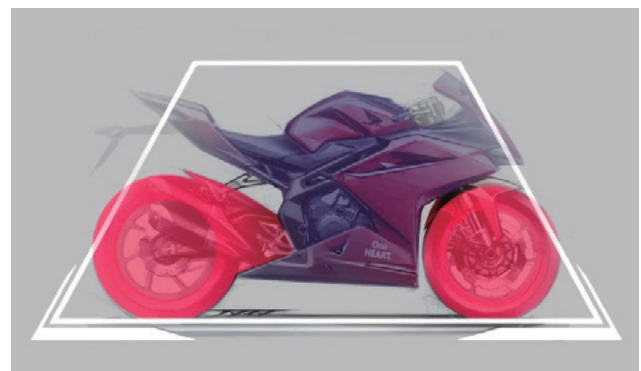


Fig. 18 Sketch showing trapezoidal design form

(Fig. 19), which further emphasizes the image of mass centralization from the peripheral to the center of the motorcycle. Thus enabled is the expression of potential that brings about a speedy image without sacrificing powerfulness while emphasizing the wheels.

These considerations have enabled impressing of the trapezoidal form and expressing of such an image that strongly kicks the earth.

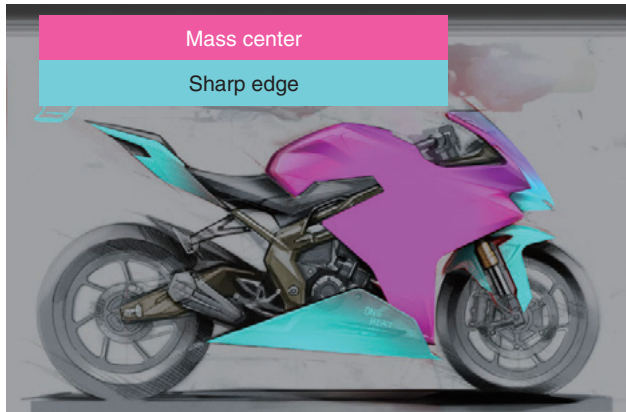


Fig. 19 Different design expression techniques depending on distances from center of mass

6. Verification of Presence in Design Options by Comparison of Virtual Models

After determination of the direction of styling by the sketch, studies of 3D model started using a 1/2 size scale model (Fig. 20). The reason why studies are conducted using a 1/2 size model is such that in addition to the possibility to produce the model in a short period of time, changes of the proportion is easy. Taking advantages of these characteristics, various studies of the 3D model



Fig. 20 Half size clay model

were conducted, the shape appearing fast even when standing still, which was required by the styling key word “Speed Shape,” was determined, and the direction of full-scale clay model was determined. As the following step, measurements were taken from the 1/2 size scale model using the optical measuring instrument, and converted to a virtual model, by which comparison was made with various models including competitive products, and various adjustments were conducted using the live size image on the large monitor screen. Also, the use of this data permitted verification of motorcycle body component layout and CFD analysis, which contributed to an early finalization of specifications (Fig. 21).

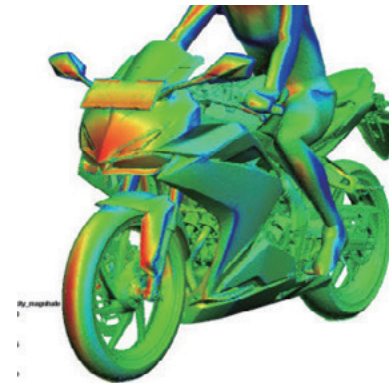


Fig. 21 Analysis of pressure distribution on cowl by CFD

7. Clay Model Production and General Design Decision

On the basis of the measurements taken from the 1/2 scale model, the full scale clay model was produced using the NC milling machine (Fig. 22). Though the data was compiled upon various studies, the impression of the milled clay model was different from the image previewed on the display. Although the data was the same, the “aura” was totally different. The powerfulness from the mass-resembling block or the edginess from the contour was unnoticeable. Also, the “high” feeling that the rider senses when sitting in the seat and grabbing the handlebar or the sense of integrity with the motorcycle when the rider sits astride was inadequate (Fig. 23). We consider such differences are inevitable from the size of model that does not permit sitting astride and the difference of eye line from the scale model. It was therefore decided to create crouching style proportion again and rework to attain edginess.

7.1. Proportion – Release of Explosive Force –

Employing the low front nose and the high-rise rear section as the basic proportion, studies were conducted on the running form and the movement of muscles of the

sprinter just after the start to express the almost ready to start crouching style.

To simulate this posture in that the athlete keeps his head down and maintains even lower posture to produce a force in the horizontal direction, the well-trained muscles, the driving force to kick the ground, and the expression of sense of speed are indispensable. Accordingly, the fuel tank is given the principal role to express the powerfulness, and from there gradual changes are made to express thinness and sharpness. While expressing flexibility, the powerfulness to kick the ground to produce a driving force is expressed by the series of flow from the middle cowl to the frame and the swingarm. The lower cowl is extended as far to the rear of the motorcycle as possible to express



Fig. 22 Production of full scale clay model by numerically controlled clay trimmer



Fig. 23 Lack of sense of unity between rider and vehicle caused by loose distances to components around rider

speediness by the long straight line tilting downward. Thus realized is the proportion that represents the moment the explosive energy contained inside is released (Fig. 24).

7.2. Fuel Tank – Overwhelming Powerfulness –

Among the cubic components, the highest level of powerfulness is expressed by the fuel tank. Assuming the top rear surface of the fuel tank as athlete's trapezius muscle and latissimus dorsi muscle, the overwhelming powerfulness is expressed by the incorporation of edgy surfaces that look as if a hard, massive block is carved with a primitive instrument (Fig. 25). Also, the knee grip area is narrowed to a minimum to express tightness. This shape contributes to easy planting of rider's foot on the ground as well as ensuring optimum holding of rider body in a sporty riding. The fuel tank shape composing of complex and stepped surfaces has been realized by the design considerations such as providing a fuel tank cover on both sides.

7.3. Front Cowl – Gazing Eyes –

The impression like a Kabuki makeup is provided by the character lines and the cut lines deeply engraved in the



Fig. 24 Implementation of crouching style concept



Fig. 25 Shape formation of back portion of tank expressing powerfulness (4-piece tank coverings configuration)

front cowl. Moreover, the shape that looks like intimidating, glaring at the other party has been realized by the reverse-slanted shape of the headlight laid beneath the lowly positioned front nose (Fig. 26).

7.4. Middle Cowl – Edginess and Presence –

The middle cowl has the largest surface area of all body panels. Because the surface area is large, it can end up with “heaviness” if the pursuit of powerfulness is excessive (Fig. 27). To deal with it, the middle cowl is shaped in such a manner that the entire surface is narrowed significantly from the outermost part (a) of the silhouette when viewed from the front toward the lower cowl, which makes most surfaces of the middle cowl facing downward, creating deep shades and shadows.

The air outlets are shaped as if deeply carved with a sharp object to show “awesomeness.”

The deeply overlapped layer structure in the connection



Fig. 26 Headlights that are gazing up from low position

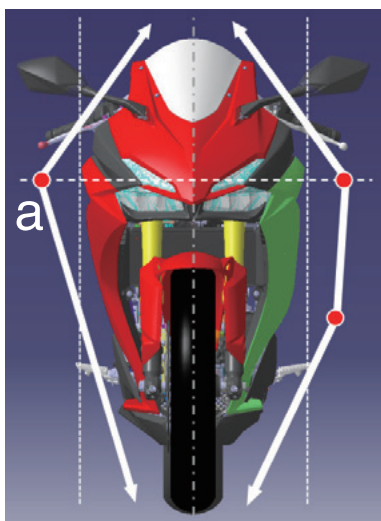


Fig. 27 Difference in impression of weighted object sense evoked by turning point(s) of outer line (ex. two points on the right side in the figure)

with the lower cowl controls flow of air in the cowl, contributing to the improved rider comfort and engine heat management. Also, the thickness of the winged shape of the layered part is reduced to the minimum to show “edginess.” Overall, by the hard-looking surface contours and the large angle given at a surface turning point, the sharp edginess and the contrast of shades and shadows are emphasized. Thus achieved is the style having the presence and powerfulness comparable to a large motorcycle.

7.5. Rear Cowl – Uplifting Image –

The uplifting image is further enhanced by incorporating a turning point in the line facing upward from the seat rail toward the rear in the side view of the rear cowl (Fig. 28). The rear cowl shape is composed of the extensively stretched, upward-facing surface in that the tension is controlled and the downward-facing surface having a stretch to receive rider’s weight. The “stretched out” shape enhances contrast with the narrowed-down seat area, thus implying “massiveness” beyond the class. The air ducts through from the front to the rear contribute to both the massiveness and the sharp swiftness of the rear cowl.

7.6. Completion of Clay Model

The concept to express the crouching style such as the well-trained muscles, the driving force to kick forward from the ground, the speediness was materialized in the form of a full-scale clay model, by which the shape expressing the styling key word “Speed Shape” was produced. The fillet in each part looks even sharper by the clear shifting of surfaces, thus expressing “sharpness like ripping the air.” Also, the shape of fuel tank, which comes into rider’s view when sitting astride, expresses overwhelming powerfulness and has an impact that makes the owner forget about the engine displacement and its class. All these considerations on shaping resulted in the “attractive style.”



Fig. 28 Enhancement of expressions by clay model for further providing uplifting feeling

8. Design Details

Described hereafter are the examples of design details for realization of the concept “attractive style.”

8.1. Headlight – Sharp Look –

The headlight and peripheral parts are designed with an aim at a “sharp look” image to signify “Speed Shape.” The overall light body is composed of four individual lights; two head lights and two position lights to express personality and presence. The position light is of such a shape that is narrow and raised toward the side symbolizing the eyes of an animal trying to catch a game. That further enhances the sharp-looking design of the headlight (Fig. 29). To express the sharp eyes, the plane emission light with a light guide is employed so that the light reaches to the ends.

The RR logo is etched into the headlight reflector (Fig. 30). Like that, the playful mind is maintained even in such a detail that is usually out of sight.

8.2. Tail Section – Expression of Innovative Spirit and Speed –

Considering a matching with the front end design, the

upper and lower, two-tier lens design is incorporated in the tail light unit. The upper tier tail light expresses innovative spirit by the plane emission using the light guide, which is usually employed in large motorcycles. Using a reflector-type stop light in the lower tier, the contrast is emphasized from the upper tail light in the appearance and when lit. With the different lighting characteristics given between the upper and lower lights, the two-tier tail light design becomes even more impressive (Fig. 31).

Incorporating the air ducts in the tail cowl, the appearance lets the viewer imagine air flow management as well as symbolizing speed (Figs. 32 and 33).

8.3. Layered Wing – Detailed Styling Design to Make the Viewer Perceive Speed –

As a way to express the speed for completion of “Speed Shape,” the design having wings is applied to the middle cowl. That design is inspired by the shape of canard, which is seen in fast vehicles such as the super car, F1 machine, MotoGP machine. The vehicle having such a wing makes the viewer imagine air management even when not running and perceive superb running performance at high speeds. This winged shape is an important element that impresses



Fig. 29 Sharp face demonstrated by headlights design



Fig. 30 RR logo on outer upside of extension of headlight reflector



Fig. 31 Two tiered arrangement of upper and lower LED taillights

the style that “looks fast even when standing still.” The unique construction having the end of middle cowl stretched out as a wing from the side of lower cowl also serves as an engine cooling air intake (Fig. 34).

Note that the design incorporating the winged shape is also applied to the front and rear ends.

8.4. Twin Muffler – Presence Symbolizing High Performance –

The twin silencer symbolizing high performance contributes both for the noise suppression and the high power output. The high volume silencer to achieve the target performance is slimmed down by employing the twin silencer construction. The narrow muffler helps to maintain a large banking angle, which contributes to the cornering performance necessary for a super sport model. Appearance-wise, the uniquely shaped cross section of each silencer is also a remarkable feature (Fig. 35). This twin muffler design expresses performance that symbolizes



Fig. 34 Layered cowl and rear cowl expressing speed by wing shape



Fig. 32 Air guiding intake openings on rear cowl



Fig. 33 Air outlets on rear cowl



Fig. 35 Twin mufflers with variant cross sections

a high power output, and realizes the powerful image comparable to a large motorcycle.

8.5. Large Fully Digital Meter – Visualization of Performance and High Tech Image –

The engine performance featuring the highest power output of the class is visually represented by this meter. We want the instrument make the rider envision speed the moment he turns the ignition key. The large fully digital meter having the largest size in the class and designed with the aforementioned intension is of such a graphic design in that the tachometer is deliberately laid in the center of the meter unit (Fig. 36).

The initial display appears as per the following sequence. Firstly, as the ignition key is turned, the tachometer turns up to the maximum revolutions. Then, all the LCD segments glow, and just after that, each segment goes off in a random order. Lastly only the “CBR” logo remains to make the rider excited. In sport riding such as on a race track, it is necessary for the rider to read the meter quickly by a glance. Accordingly, a large, fully digital meter is employed in liter-class sport models with an LED shift-up indicator provided on top of the tachometer. With these display considerations, the rider can recognize the information on the meter in a part of his vision even when taking a fully tacked position. The large fully digital meter employed in this model also has the similar function. Taking into account the recent trends, such a type of LCD, which is the core of the meter, having a narrow frame is employed for a high tech image. Also, the control buttons, which are usually made of rubber, are made of plastic having the same tone as the meter panel to realize the appearance that lives up to user expectations.

8.6. Wheel and Suspension – Envisage Performance beyond the Class –

The upside-down front fork and the aluminum swingarm employed to realize performance beyond the class are also aimed at realization of the “attractive design.” As mentioned



Fig. 36 Large-sized fully digitized gauge unit

in the preceding chapter, such a design is employed in that the upper line of the swingarm is aligned with the line of the main frame to make the viewer feel powerfulness that kicks the ground even when standing still or imagine agility and lightness. This design significantly contributes to the representation of “crouching style” as well as maintaining a sense of integration with the motorcycle (Fig. 37). With the 7-spoke design employed in the wheels, the image of the thing that runs fast like the MotoGP machine RC213V is incorporated to emphasize speed.

8.7. Frame Body – Attractive Structural Body –

As mentioned earlier, it was necessary for the styling designers and the frame/engine designers to collaborate at such a level in that each party stepped into the other’s territory to achieve the “Speed Shape” of this model. Upon such a mutual understanding that “something functional is beautiful, something beautiful is functional,” discussions were repeated to realize a design achieving both style and function.

Firstly, as a basic principle, the design should be such that shows the frame body as a structural body. Accordingly, the pipe frame of a truss structure having an attractive appearance is employed while minimizing use of gusset, etc. which conceals the truss structure. Moreover, such a pipe layout that has a narrow part in the middle of frame body is employed to realize a distinctive body shape.

Also, considerations such as laying the pillion foot peg bracket retainer behind the frame are given to avoid spoiling of the appearance of the frame pipe. That allows to cleanly show the seat rail line that connects the pivot plate to the rear cowl, contributing to demonstration of the “Speed Shape.”

The targeted “attractive style” is also realized in such design details, which successfully make the personality of CBR250RR outstanding.

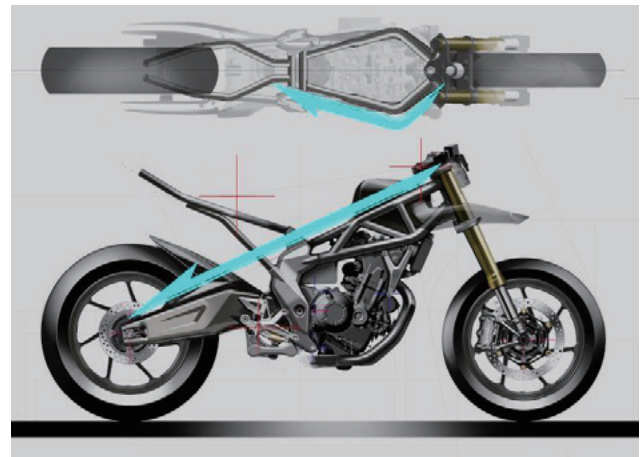


Fig. 37 Expressing unity of vehicle body by aligning main frame and upper edge of swing arm

9. Coloring

The coloring is an important element to convey the model concept to the customer by the first impression.

It is essential to adhere to the basic principles on the appearance to properly convey the model concept “attractive style,” “attractive features” and “attractive performance” to the customers who see this motorcycle for the first time.

The studies of coloring often start after the shape is finalized. In this model, however, the styling designers and the coloring designers mutually exchanged comments across their specialties to realize the solid design.

An important design element of this model is “show off.” Accordingly in the coloring design, the “attractive” coloring is realized to satisfy users’ desire to “look cool.” With respect to the element that realizes “appeal” in terms of coloring, we defined it should be in agreement with each customer’s “sense of value that connects to coolness” in addition to being trendy and innovative. In many cases, the coloring is finalized taking into account the unique requirements of the local market. The target users of this model, however, are those who share global trend and/or sense of value regardless of the subject country. Accordingly in the coloring for those people, we aimed at such coloring that would be globally recognized and accepted rather than being conscious of region-oriented coloring.

When it comes to the “sense of value that connects to coolness,” how to interpret it differs from a person to another. For example, while some may see it cool if he can ride the motorcycle in a stylish manner in the metropolis, others may consider only the racing motorcycle is the symbol of coolness. Rather, there are some who think the only coolness is being eye catching in a group. To respond to those various senses of value, the color scheme comes in 3 themes, 5 types. The color line up is provided to cater for users’ wide variety of demands.

1. Street sport color (2 types)
2. Racing sport color (2 types)
3. Special graphic color KABUKI

The theme and the background of each color are described hereafter.

9.1. Street Sport Color

To create a stylish riding image in the metropolis, the monotone color is selected as the main color of the street sport model, and positioned as the standard color. As the monotone color is easy to make a good match with the cloths and looks nice in any situation, it helps to bring up rider’s image. While employing the monotone color having a quiet image as well and using the color trend of super cars and others, we worked out a way to “appeal” in the daily use situation. Accordingly employed was the method that effectively laid high chroma colors in the monotone color.

9.1.1. Matte black

The matte painting has microscopically uneven surface that diffuses light, it prevents reflection of nearby objects, and is used in military equipment such as the stealth airplane. Especially the matte black has such a visionary effect that hides the object from enemy’s eyes at night. Due to the history of use in military equipment and the hiding effects, the color makes the viewer feel fear, awesomeness, and force. The concept model (Fig. 38) of this motorcycle was intended to display at the motor show as a mystery model. Accordingly, the matte black was selected because it was effective to create a mysterious image and express force and awesomeness of the styling design. Being the good reputation at the show one of the reasons, the color was employed in the mass production model (Fig. 39). With an aim at enhancement of the shape of functional parts such as the air intake, the high-chroma red is applied to the recessed surfaces (Fig. 40). Having such backgrounds that the black with red insets is a popular color of Honda motorcycles, the matte black is positioned as the theme color, and used in the catalogues and photo books.



Fig. 38 Concept Model of “LIGHT WEIGHT SUPER SPORTS CONCEPT”



Fig. 39 Matte black color applied to mass production model

9.1.2. Dark metallic silver

Recently in Indonesia, which is one of the main target markets, such information as “silver is popular in European automobiles” is spread among the rich class having global sense of value. Basically the silver has a strong image of a color for public vehicles such as the taxi, its value for personal car has been low. Due to the above-mentioned information, however, the value is increasing, and some users owning a silver automobile of European brand are appearing.

Although such a trend is seen, the black is still the popular color of motorcycles and cars, and supported by many due to its sharp and strong image. Moreover in the motorcycle market, especially in the sport motorcycle category, there is virtually no variation of silver. Because the market is composed of a wider variety of customer base than that of automobiles and sensitive to the trend, the color line up tends to be composed only of popular colors such as the primary color like black, red and the racer replica color.

Although it was fairly a challenge to propose silver in this model under such circumstances, we worked out a way that allowed representation of innovative image without departing from user preference and recent color trends. Taking into account the color trend, the dark tone silver was selected. Even darker gray metallic was chosen for the lower cowl to relatively emphasize the form of the upper body while achieving a tight overall image. The yellow stripes applied as an accent to the specific areas such as the overlapping or turning of cowl surfaces depict the contour of the motorcycle (Fig. 41). The high chroma yellow is employed as the color that can create an active and innovative image because it matches well on silver although

silver is usually difficult to make a good match with a primary color.

Using the said methods, the coloring that is innovative yet agreeable to user preference has been realized (Fig. 42).

9.2. Racing Sport Color

The two types designated as the racing sport color are for customers having a high interest in the motor sport. The motor sports have a large number of followers in the world, and especially popular in Indonesian where it is growing big, and even those who don't ride a motorcycle enjoy viewing it as a sport spectator. The racing sport color symbolizes the team the fan supports, and owning a motorcycle of such a color boosts enthusiasm of the fan.

9.2.1. Repsol color

Honda has been participating in the MotoGP World Championship, which is the pinnacle of motorcycle road races, also in the year 2017, and maintaining good results. In that MotoGP class, Repsol in Spain has been the main sponsor of Honda Racing since 1995. The works machines



Fig. 41 Stripes arranged along contour of vehicle body



Fig. 40 Red color inserted on recessed sections of cowl



Fig. 42 Color of dark metallic silver applied to mass production vehicles

and the mass production models wearing the same color are usually called the Repsol Color, and widely recognized by race fans.

In the racer replica color, it is crucial to reproduce the color of the racing machine on the motorcycle having a different shape from the actual racing machine while maintaining an image close to the original. The Repsol works machines use flash orange as the main color for easy identification when on the race track (Fig. 43). In the mass-production replica models, the color scheme is materialized using stickers. To reproduce the atmosphere of Repsol color scheme, it was necessary to use large stickers. The larger the sticker, the higher the application skills required. With the cooperation from the skilled, experienced associates of Astra Honda Motor (the manufacturer of CBR250RR in Indonesia), the mass production has become a reality (Fig. 44).

The MotoGP champion racer Marc Marquez plays the role of main character in the catalogue, poster, etc. using the color scheme. He actually rode the machine at an event held



Fig. 43 REPSOL Honda Works Machine, the RC213V



Fig. 44 Replicated coloring reproducing that of original works machine

in Indonesia, and remarkably boosted the enthusiasm of the race fans.

9.2.2. New Astra Honda Racing color

Astra Honda Racing Team is participating in the Asia Road Race Championship (hereafter ARRC). The new Astra Honda Racing color is the replica color of the works racing machine since 2016.

The works machine of Astra Honda Racing Team used to use the red and white two-tone color, which was the team color, as the basis. In the new Astra Honda Racing color, the black and gray graphics are boldly added to the traditional red and white to tighten up the overall image. The graphics running fore and aft on the fairing further emphasize the forward leaning posture and the sharply lifted rear section. Using the large stickers, this color scheme makes the lower half of the motorcycle appear as if painted white to achieve an agile image. With these methods applied, the speediness, which is the aim of the replica color, has been expressed (Fig. 45).

Astra Honda Motor is participating in the 2017 ARRC AP250 cc class by the CBR250RR wearing this color scheme. Being an owner of the motorcycle wearing the replica color of the winning works machine is a big joy and pride for the race-fan user.

9.3. Special Graphic Color KABUKI

The “special graphic color KABUKI” is provided exclusively for the Indonesian market.

In the Indonesian motorcycle market, custom coloring is popular using stickers and wrapping films. Having such trends on the backgrounds, this color scheme is based on such a concept that the manufacturer provides customized version of this model. Before starting the initial coloring design, we worked out a design theme referring to the results of market survey. In the process of seeking various design directions, it has become clear that the animation culture of Japan, the graphics using “Kana” (Japanese



Fig. 45 Coloring of Astra Honda Racing for mass production model

characters), etc. are recognized also in Indonesia as one of the globally accepted expressions (Fig. 46). Moreover, the word “cool Japan” has penetrated worldwide as a key word of subculture trends. On the basis of these findings, design studies were conducted having “Japan” as a principal theme (Fig. 47). Kabuki is used as a motif of the bold graphics drawn on the entire body panels. The title of the Kabuki performance giving the motif is “Shibaraku,” which is a standard of classic Kabuki performances. There are scenarios having a man playing the key role and another having a woman playing the same. Taking the main character of the performance as the motif, the woman is drawn on the right side and the man on the left side, which results in a unique asymmetric design (Fig. 48). The lines



Fig. 46 Graphics with Japanese motifs seen in Indonesian market



Fig. 47 Conceptual sketches on coloring developed from “Japan” as design motif



Fig. 48 Coloring for mass production model with asymmetrically designed left and right graphics based on motif of Kabuki

as if drawn with a stroke of brush are connected to a line of the hair or the outline of the character when combined (Fig. 49). By pasting split stickers in proper combinations, we aimed such an expression that looks like a graphic that fully wraps the entire fairing when viewed from a distance. With the black and white used as the main graphic color and the front and rear wheels colored differently in black or white, the graphic design is finished in such a manner that the first impression is high contrast and eye catching. In the meantime when viewed from near, the viewer can recognize the graphics having “Hanafuda” (Japanese card for game) as a motif scattered around at a low contrast (Fig. 50).

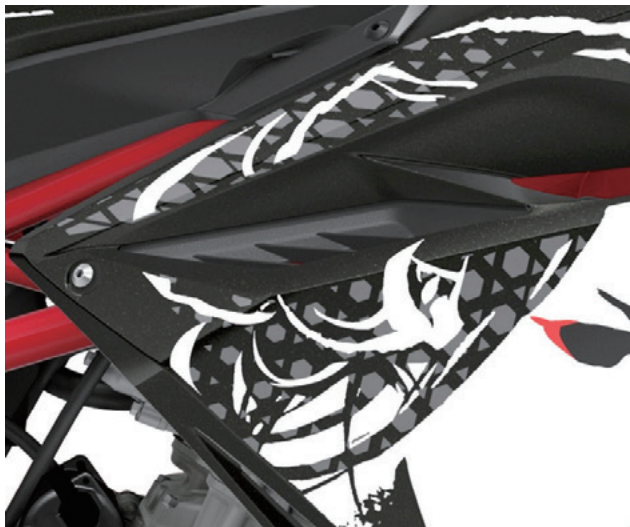


Fig. 49 Representation of contours of face and hairs with brush stroke touch

Though they may appear commonly known Hanafuda at a glance, various parts of this motorcycle are illustrated on each card, which would be a surprise hidden in the details when found. Using such methods, the color scheme like a customized motorcycle, which is a challenge in a mass-production model, has been achieved.

10. Conclusion

In the styling design of CBR250RR, we always aimed at “attractive style.” For styling, we set the key word “Speed Shape,” which means that the motorcycle looks fast even when standing still. To materialize the key word, multi-faceted approaches were made from the perspectives of basic frame structure, overall proportion, details of functional components, and coloring.

Maintaining communication with the engine and frame design teams, the basic frame structure was determined keeping in mind realization of the design key word “Speed Shape,” and achieved the wedge shape that should stand out when compared to other motorcycles. Moreover, using various methods to make the motorcycle look fast such as the crouching style in various areas of styling design such as the sketch, clay modeling, up to the designing of functional parts, the “Speed Shape” has been realized.

In terms of coloring, the personality of this model is appealed even more strongly by the globally-attractive graphic design.

This model was launched in Indonesia in October 2016, and gained remarkable popularity from a large number of customers. It was also launched in Japan in May 2017, and received a large number of orders as soon as introduced.

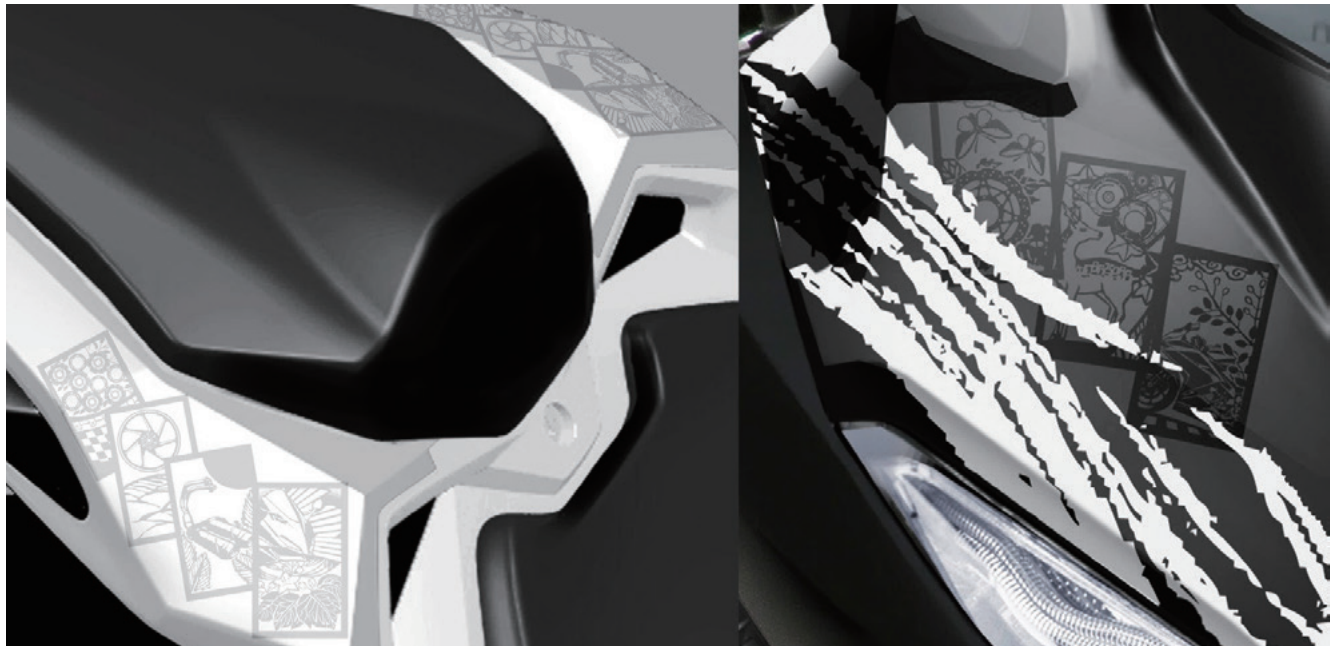


Fig. 50 Graphics featuring Hanafuda (Japanese floral playing cards) as motif

From the reputation from the users and the media, we trust the original goal of the styling design has been achieved.

We hope this styling design will become a new benchmark for the future super sport models in the 250 cc class.

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