

Styling Design of NC700 Series

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ABSTRACT

The NC700 series was developed based on the concept to offer user-friendliness and convenience focused on daily uses, i.e. offering the enjoyment of maneuvering a motorcycle, consideration to the environmental issues and a good fuel efficiency with a reasonable price as well. While using the same shared platform, by applying the styling techniques on these series of motorcycles, it is realized to differentiate three forms: “Naked Sports,” “Crossover Concept,” and “Scooting Motorcycle.”

1. Introduction

In the motorcycle market in developed countries, while absolute performance in terms of factors such as top speed and acceleration is prioritized, the desire for low-cost models with effortless maneuvering and a relaxed riding experience is also increasing. The project discussed here set out to respond to this diversification of customer desires not with a single motorcycle, but with three different types of motorcycle based on a single platform. However, this demanded the realization of differing concepts and styling while sharing major components including the framework and the engine, a bold concept without precedent in previous motorcycle developments. The designers wished to create a motorcycle that could be used comfortably in a variety of scenarios. The NC700 series emerges from styling design development efforts based on this way of thinking.

Embodying a totally new concept without comparable former examples (including the development methods employed), packaging, and sense of what is important in a motorcycle necessitated the creation of a design method from zero, and represented a considerable challenge for the designers.

2. Styling Concept

The development target was to offer motorcycles with a user-friendliness for daily use that made it possible for anyone to use them, possessing a new level of lightness and comfort and offering a rich and pleasurable experience, but with good fuel efficiency and at an affordable price. The shared styling theme for the three models was to give form to rider-friendliness and the essential pleasure of using a motorcycle in the domain of daily life. By contrast with

the mindset so often associated with sport motorcycles, which prioritizes performance above all else and seeks high speed and high power, this approach focused on elements including relaxation, safety, smart features and environmental friendliness.

Styling design for the three models based on different concepts was realized (Figs. 1, 2 and 3) in order to



Fig. 1 Concept sketch and clay model of NC700S

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Fig. 2 Concept sketch and clay model of NC700X



Fig. 3 Concept sketch and clay model of INTEGRA

offer user-friendliness to a broader range of customers and respond to their preferences, including customers who sought a style different to that of edgy, high-priced motorcycles, customers who had enjoyed riding motorcycles in the past, beginning riders, and customers seeking a convenient mode of transport around town.

In proceeding with the styling design, the following six items were established as shared points for the three models:

- (1) To be a creation uniquely by Honda.
- (2) A global design that could be appreciated anywhere in the world, based on the conviction that good design has no borders.
- (3) Accurate communication to customers of the designers' message and commitment to quality.
- (4) Expression of a well-organized, modern image motorcycle that stands out clearly yet fitting perfectly in urban areas.
- (5) Expression of a sense of value that is not obsessed with hierarchies based on performance or displacement.
- (6) Realization of an affordable price, but appealing to customers with a sense of quality in excess of the price.

3. Design Method for Realization of Three Models using a Shared Platform

In designing the motorcycles, the main point of focus was the attempt to prevent customers being aware that a shared platform was used.

What was necessary was to make the differences between the concepts of the "Naked Sports" NC700S, the "Crossover Concept" NC700X, and the "Scooting Motorcycle" INTEGRA clear by means of the styling.

Using a shared platform for three models for which the needs in terms of layout, including the silhouette of the vehicle as a whole, the shape of the frame, and the type of engine, would normally have been entirely different, represented a considerable challenge. The points of the design procedure were to create three different concepts and realize them in styling shapes without creating each individual base design separately as in conventional design approach.

3.1. Body Frame

In sharing a platform between the NC700S and the NC700X, which have a standard motorcycle shape in which the tank is sandwiched between the knees, and the INTEGRA, which has no tank section, the first element for which a breakthrough was needed was the body frame (Fig. 4).

For the NC700S and the NC700X, to help ensure the stiffness of the frame, the head pipe and the swing arm pivot would be connected in a straight line by a main pipe, as in standard sports models. Exposing this main pipe to allow it to be seen would also, from the design perspective, express a mechanical feel. In the case of the INTEGRA,



Fig. 4 Perspective drawing of three NC700 series models

however, designers sought to make the floor tunnel as low as possible, and it was therefore necessary for the layout to position the main pipe as low as possible.

In this model, the use of a diamond frame in combination with an engine unit with a low total height helped to ensure frame stiffness and made it possible to position the main pipe at a lower level than in a conventional motorcycle. The layout was designed to optimize the fitting of the main pipe around the engine, the points at which the pipe curves, and the positions of welds from both functional and visual perspectives, making it possible to produce a body frame that would function as a key element of the shared platform for the three models.

4. External Structural Parts and Differing Proportioning of Three Models

“External structural parts” refers to functional parts designed to clearly differentiate the styling concepts of the three models.

The NC700S and NC700X share the basic silhouette of a standard motorcycle as a common point. However, for the NC700S, designers sought to proportion the motorcycle to offer a simple, slightly forward-tilting, sporty basic feel characteristic of a sports motorcycle, with

a relatively low frontal area. In the case of the NC700X, by contrast, the proportioning sought to create an upright feel, with a slightly raised frontal area, in order to express the concept of a “crossover,” a fusion between on-road and off-road.

With its wide seating-position tolerance, the INTEGRA was given a scooter-like basic silhouette that emphasizes its user-friendliness in around-town riding.

The realization of very different proportioning for each motorcycle by means of external structural parts in this way represented both the challenge and the excitement of the styling design of the NC700 series.

4.1. Styling of NC700S

The NC700S offers the rider easy access to the exhilaration, mobility, and comfort inherent to “naked sports.”

“Modern Fluid Form” was set as the styling theme to express the appeal of this concept. Elements suggestive of sports gear were modeled solidly and simply, expressing a modern feel and a distinct uniqueness, even as the motorcycle remains a standard model. The simplicity of the area around the headlight and the motorcycle’s slim and compact exterior, fashioned using only the minimum necessary parts, are also significant features of this model.

The readily apparent and broadly appealing “Naked

Sports” styling of the motorcycle will appeal to both beginner and veteran riders with no sense of discord (Fig. 5).

4.2. Styling of NC700X

The “Crossover Concept” for the NC700X sought to embody a new way of thinking through the fusion of the different appeal factors of on-road and off-road. “Smart, Tough Body” was set as the styling theme in order to express the appeal of this concept. Smart but tough images are fittingly fused into crossover design through the characteristics created by the combination of parts painted with main body color, which feature the streamline design of the body, and parts made of pre-colored materials, whose tough-image shapes are designed to function as protectors as well (Fig. 6).

4.3. Styling of INTEGRA

The “Scooting Motorcycle” concept developed for the INTEGRA fused the pleasure of riding a motorcycle with comfort and convenience for commuting (Fig. 7).

With “Energetic Elegance” as the styling theme, the antagonistic elements of sporty/powerful and elegant/aesthetically pleasing were re-envisioned and fused at a high level to produce a novel styling. This model presents an entirely new, unprecedented concept.



Fig. 6 Image sketches of NC700X



Fig. 5 Image sketches of NC700S

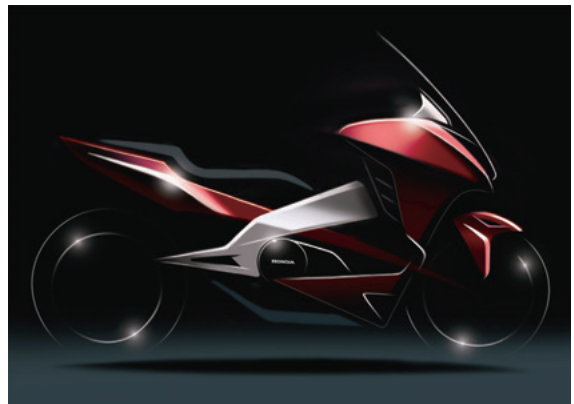


Fig. 7 Image sketches of INTEGRA

5. Shared External Structural Parts

The platform concept and packaging were the absolute foundations of this development.

For the major parts shared by each model in the series, including the engine, intake and exhaust system, cooling system, body frame, chassis components such as suspensions, wheels, brakes, and lighting devices, high-quality, modern and clean design that would not interfere with the individuality of each model was employed.

5.1. Engine Design

In order to realize overall layouts for the NC700S, NC700X, and INTEGRA emerging from the entirely different concepts, it was necessary to use an engine with an extreme forward-incline cylinder configuration. Designers sought to utilize this characteristic, quite exceptional for a sports motorcycle, to realize a unique and individual engine design.

In order to effectively express the design themes “Clean” and “Modern,” shared between the three models, both the left and right crankcase covers were given a modern, sculpted form. In combination with the unique inclined silhouette, the engine design imparts a sense of the functionally featured beauty of the motorcycles (Figs. 8, 9 and 10).

5.2. Design of lighting devices

The design needs in relation to the headlights of the three models clearly differed due to the differences between the concepts for each. This is because the headlight and surrounds represents the “face” of a motorcycle, and is therefore one of the most important iconic elements of the vehicle. This made it essential to realize entirely individual expressions while sharing the headlight units.

Taking into consideration the fact that there should be no design discord for any of the three models, the core element, the basic shape of the headlight unit, was designed as a simple V shape.

In the NC700S, the shared headlight unit is inserted

in handle-mounted aluminum headlight stays in a parts configuration that also features a mini visor, creating a sporty and modern front area (Fig. 11).

In the NC700X, the shared headlight unit is built into the front cowl, which forms a nose as a feature of the “Crossover Concept”; the image created is one in which the colored plastic elements are guarding the headlight unit surrounds. Aluminum meter stays also serve as an element composing the external appearance of this section, helping to express a

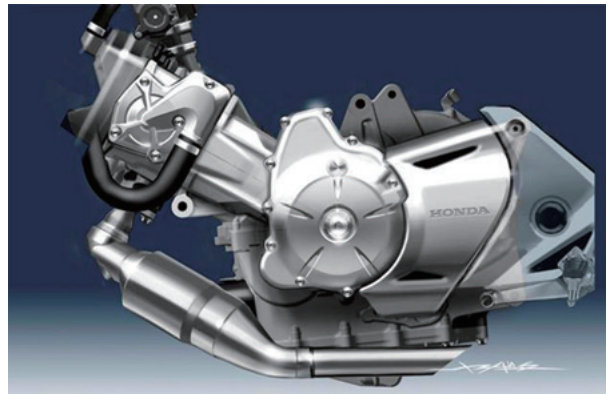


Fig. 9 Engine sketch (Left side)



Fig. 10 Engine sketch for dual clutch transmission model

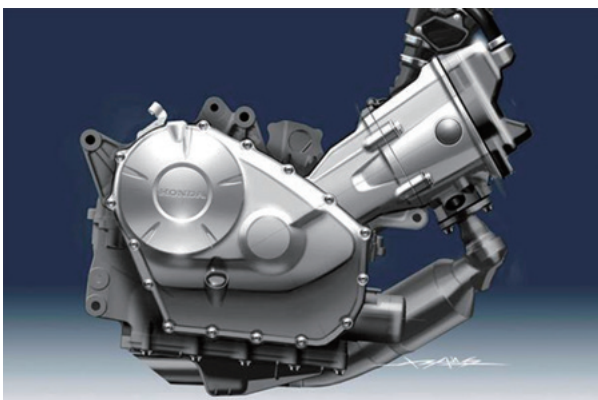


Fig. 8 Engine sketch (Right side)



Fig. 11 Front view of NC700S

“face” that reconciles tough and smart (Fig. 12).

In order to realize a luxurious and dynamic feel in the INTEGRA, the shared headlight unit, which is built into the body, is inserted in a sub-headlight unit that is incorporated with the combined function of turn signal and position lamp. The combination of a headlight incorporating a sub-headlight and texturized with metallic screen stays realizes a vigorous and elegant “face” (Fig. 13).

In the complete vehicles, the differing individuality and expression of the three models is realized without compromise.

5.3. Meter Unit Design

Because the meter display is immediately captured by the rider’s eyes, it is considered to be the most important functional unit in the cockpit.

The shared meter unit for the NC700 series offers a full liquid crystal display, and is designed to express the modern feel of a meter used on the very latest model of motorcycle, simple with no idiosyncrasies. The design of variations for the three models took into consideration variation of the meters’ expression through combination with the shaping of the surrounding area.



Fig. 12 Front view of NC700X



Fig. 13 Front view of INTEGRA

In the NC700S, a simple and sporty handle-mounted meter emphasizes a feeling of lightness and nimbleness (Fig. 14).

In the NC700X, body-mounted aluminum stays are used to give the meter unit a floating mount, making it easy to see in an upright riding position and offering a styling that stimulates the spirit of adventure associated with the “crossover” between on- and off-road (Fig. 15).

In the INTEGRA, the shared meter unit is arranged in an instrument panel designed on the basis of an image of the cockpit of a four-wheeled vehicle, realizing a luxury vehicle feel. In the rider’s eyes, it appears to be a cozy and comfortable environment (Fig. 16).



Fig. 14 Meter display unit of NC700S



Fig. 15 Meter display unit of NC700X



Fig. 16 Meter display unit of INTEGRA

5.4. Design of chassis components and Muffler

The configuration of the chassis components was basically shared between the three models, with the longitudinal length of the suspension being extended by 30 mm in the case of the “Crossover Concept” NC700X only.

A light and modern design realizing good compatibility with both the standard and “scooting” motorcycles was employed for the wheels (Fig. 17).

The muffler is made of stainless steel and is designed to maintain a standard shape while emphasizing the shape of the body as well as creating a graceful appearance around the rear of the vehicle. This same muffler is basically shared between the three models, with only the INTEGRA employing a muffler end cap for a feeling of luxury (Fig. 18).



Fig. 17 Front wheel of INTEGRA



Fig. 18 Muffler of INTEGRA

6. Utility Space and Riding Style

In the concept established for the NC700 series, the existence of a utility space was an important appeal factor of the motorcycle.

Conventional motorcycles do not usually offer a storage space, and riders have to place anything they desire to

carry in a backpack that is then either worn or attached to the rear seat or other part of the body, even if the rider is only making a short trip. Regular carrying of luggage on the motorcycle necessitates the attachment of a top box, panniers, or similar accessories to the body.

The provision of the NC700S and the NC700X with 21 L storage spaces frees riders from the nuisance involved in carrying luggage.

This utility box provides another benefit with its visually sharp appearance, since the baggage is concealed within the vehicle body. We believe that the total beauty of motorcycle styling can only be considered when it includes the rider sitting astride it as well. The provision of a utility space therefore has considerable merit.

As Fig. 19 shows, the NC700S and NC700X feature utility spaces able to hold an extra-large full-face helmet in the shelter area in front of the seat, corresponding with the position at which the knees grip when a rider is sitting on the seat. Trimming back the layout to the limit in this way has made it possible to realize a sculpting with no sense of discord, either functionally or aesthetically. In concrete terms, the design process optimized elements such as the orientation and angle of helmet storage, the thickness of its exterior walls, the cut-line of the lid, and the lock mechanism in units of millimeters, crafting the configuration down to fine details.

This has resulted in the achievement of a slim and natural profile fusing styling and function (Fig. 20).



Fig. 19 Utility space of NC700X



Fig. 20 Shelter and seat of NC700X

In case of the INTEGRA, which does not have a shelter, a 15 L storage space has been provided under the seat (Fig. 21).



Fig. 21 Utility space of INTEGRA

7. Conclusion

The vision for the shared styling design of three models of motorcycle was to take a further step in the evolution of the motorcycle, expressing in form the essence of the pleasure of using a motorcycle in daily life.

Three models were created on the basis of entirely different concepts: the “Naked Sports” NC700S, incorporating an image of sports gear and designed to realize both a sporty and a modern, urban feel; the NC700X, in which, based on the “Crossover Concept” between on-road style and off-road styling, two contradictory design elements of rough and sporty are harmonized without perception discrepancies; and the INTEGRA, featuring an unprecedented proportioning that fuses the convenience of a scooter and the sportiness of a motorcycle.

The designers of the NC700 series hope that it will serve as a benchmark for one orientation in the future of the motorcycle.

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