

2003 CBR600RR

NEW Locking pillion pad opens to reveal compact carrying space for small-sized U-lock and other essentials.



NEW Lightweight, ultra-compact 7-segment LED taillight hovers over aggressively styled Centre-Up exhaust pipe.



NEW Lightweight stainless steel Centre-Up exhaust system extends up under seat cowl for unimpeded cornering clearance.

NEW Race-ready triple-spoke aluminium wheels feature more compact hubs for lighter weight and sharper handling.



NEW Lightweight hybrid aluminium swingarm carries revolutionary, new Unit Pro-Link suspension system within its massive cast pivot section.



NEW Revolutionary new Fine Die-Cast aluminium frame achieves supreme balance of light weight and optimised rigidity for both track and street.



NEW All-new 598cm³ inline-4 engine achieves both stronger power characteristics and ultra-compact configuration for optimised mass centralisation and quicker, lighter handling.

NEW New fuel tank cover conceals centralised fuel tank and Dual Sequential Fuel Injector-equipped aircleaner under its 70mm-shorter form.



NEW Slim, lightweight instrument module with 15,000rpm redline tachometer, digital LCD speedometer, multi-segment fuel gauge and blinking H.I.S.S. warning light.

NEW New dual Line Beam multi-reflector headlights provide brilliant nighttime illumination from their ultra-narrow form.

NEW Direct Air Induction ports feature 2-layer design with aerated outer layer to enhance high-speed manoeuvring ease.



NEW High-performance 4-piston brake callipers grip large-diameter 310mm floating rotors for World Supersport-class braking control.

2003
CBR600RR
PRESS INFORMATION

Introduction

Over the 16 years since its legendary 1987 debut, the CBR600F has won fame, acclaim and countless racing titles with its hard-hitting combination of light weight and strong, responsive performance. Widely praised for its smooth, unruffled power delivery, the CBR has come to be relied on for providing the best of both worlds: easy manners and predictable performance for day-to-day riding coupled with race-winning potential at the most competitive levels of World Supersport competition.

However, as tastes have changed over recent years, and greater interest has been shown in the more intensive performance capabilities of the motorcycles in the 600cc Supersport class, especially as related to racing, the gap between the CBR600F's traditional emphasis on top performance combined with easy, accessible street manners, and the narrow-focused performance required for circuit domination has steadily widened.

In response, Honda decided against totally upgrading the popular CBR600F to full race-ready spec, and thereby altering its position as the class's finest and most effective all-round Supersport road bike. Instead, they set out to create an entirely new middleweight class machine designed to meet the hyper performance requirements of the more focused competitive end of the class spectrum, while leaving the CBR600F to continue in its traditional role.

Development Concept

Infused with technological advances gleaned from Honda's intensive racetrack research, the new CBR600RR more than anything owes its existence to Honda's latest racing masterpiece, the RC211V currently being piloted by Valentino Rossi, Tohru Ukawa and Daijiro Kato to a remarkable first year's domination of the new MotoGP Grand Prix racing series.

Starting from the key concept of 'Innovative Wonder,' the new CBR's development team went straight to the source of its most impressive technological achievements, the racetrack, and borrowed heavily from developments created for its Superbike and MotoGP racing efforts, with special attention paid to the revolutionary new RC211V. And to leave no mistaking its single-minded intent to restore the 'CBR' name as the undisputed high-performance benchmark of the middleweight Supersport class, this new creation was given Honda's famed 'RR' mark of distinction, which currently graces the popular and highly tuned CBR RR FireBlade.

The guiding theme of 'Innovative Wonder' extends to every facet of the new CBR600RR's design, and was conceived to provoke a deep sense of wonder and amazement at every sensation felt in savouring the high-performance results of the intensive research and development that energise its design. Developed to achieve unprecedented levels of performance in the hands of those who can take full advantage of its riding and racing prowess, the new CBR600RR is not only one of the lightest machines in its class, its weight distribution has been totally revised to achieve a much more mass-centralised form that reacts instantly to rider inputs with faster, smoother and more easily controlled changes of direction. Playing a central role in this heightened performance capability is a radical, new cast aluminium chassis that sets a new benchmark in

manufacturing expertise while realising a more accurately tuned balance of light weight and race-ready rigidity.

Stronger power was another obvious goal in this new class leader, but more than that, the new CBR600RR's power delivery comes on stronger everywhere in its remarkably wide powerband, especially at the high engine speeds reached in racetrack competition. This was achieved with a major redesign and repositioning of many of the engine's essential components, as well as through the development of a new Dual Sequential Fuel Injection (DSFI) system that dramatically broadens its optimal range of operation. All these advances assure that the new CBR's desired sense of wonder will be felt at every twist of its throttle.

With such features as its radical new, race-ready RC211V MotoGP styling, completely new, more compact and powerful fuel-injected engine, highly rigid hybrid aluminium chassis and swingarm, revolutionary new Unit Pro-Link rear suspension taken directly from the RC211V, and a host of other 'quantum leap' advances in design, construction, power delivery and handling all clearly showing the direct results of Honda's MotoGP development efforts, the new CBR600RR presents a new, more wildly aggressive form and function that add an electrifying excitement to its sense of Innovative Wonder.

Destined to reclaim its throne in the 600cc Supersport class on both the street and the track, the new CBR600RR puts Honda's extensive racing experience on the pavement in an unprecedented advance of technology and performance as only Honda can create it. Looking just like the remarkable RC211V at stop, this breathtaking new middleweight champion will make any rider feel like Valentino Rossi when the riding gets fast and furious.

Styling

The new CBR600RR is nothing less than a road-going replica of Honda's current new MotoGP racing champion, the RC211V. Packed with a veritable plethora of leading technology gleaned from and proven on test tracks and racing circuits the world over, this new midrange class 'RR' also takes its styling cues from the most dominant force in MotoGP's premiere season. Unlike anything seen before on the street, and certainly unlike any of its predecessors, the new CBR's fairing features a sharper nose with a much lower windscreen compared to the CBR600F and F/Sport, and a form geared much more to the needs of the circuit than to the comforts of the street. Like the RCV, its smaller, more compact fairing achieves a fully optimised balance of the competing qualities of high-speed aerodynamic function and lightweight, instantly responsive control.

The CBR600RR's newly designed fuel tank, or to be correct, its new fuel tank cover, is fully 70mm shorter in length than the tank on the CBR600F or F-Sport. Based on a format conceived for and tested on the RC211V racer, this new design plays a fundamental role in the new RR's compact configuration and swift, neutral handling, as it allows the rider to sit more forward, both closer to the steering head and closer to the machine's overall centre of mass. The actual fuel tank shares the space underneath the cover with the airbox, and makes a critical contribution to the new CBR600RR's guiding concept of total mass centralisation.

The CBR's sleek seat cowl also features lighter looking lines and smoother curves that flow back to terminate in a slimline LED taillight display that is lighter and thinner by half than the LED taillight featured on the CBR RR FireBlade. The new seat cowl also mounts a small pillion seat

pad that provides a comfortable enough perch—if necessary—for brave-hearted passengers. However, this pad would probably best be left unoccupied to make the very most of the new CBR600RR's hard-charging performance potential. Beneath the seat cowl protrudes another highlight of the CBR600RR's new design: its new Centre-Up exhaust system.

Sleek, New 'Line Beam' Dual Headlights

Brilliantly adding to the new fairing's sleek and speedy MotoGP look are a radical new pair of 'Line Beam' headlights that project a more modern and boldly aggressive image. Built into the leading edge of the CBR's new front cowl and featuring a compact, new high-illumination multi-reflector design, the clear lenses of these startlingly distinctive headlights are less than half the height of the dual headlights currently seen on most road bikes, yet provide a bright, clear view of the nighttime road ahead while imparting a wilder, more dynamic look that's right in line with the new CBR600RR's sports-oriented development concept.

New Wind Tunnel-Tested Induction Ports

A major performance feature of the CBR600F for the last few years, the fairing's large, forward-facing Direct Air Induction ports are now positioned outside and below the new headlights, where they continue to feed large quantities of cool, power-producing air into the large-capacity airbox now located under the forward half of the CBR's new fuel tank cover. Extensive wind tunnel and track testing found that such large intake ducts tend to impart a vague resistance to rapid changes in direction at full racing speeds, thus causing the motorcycle to feel almost as if it has locked onto target or cornering attitude.

To counteract this phenomenon, the RR's ports were made in a simple yet highly effective new twin layer design, with holes punched through the outer layer to allow air to ventilate through and break the 'grip' of the airstream rushing into the ports described by the inner layers. As insignificant as this modification may seem just looking at it, the difference it makes on the RR's high-speed handling and 'flickability' through a racetrack's chicanes and similar manoeuvres is positively breathtaking. Coupled with the new CBR600RR's highly centralised mass and other race-bred improvements, high-speed handling is as lithe and responsive as imaginable, and overall control is taken another rank higher in performance.

New 4-into-2-into-1 Centre-Up Exhaust System

Certainly another eye-catcher on the new CBR600RR is the large single exhaust pipe looming menacingly out from under the rear of the seat like the afterburner on a jet fighter. Following the lead of several of the world's most competitive race machines, including Honda's own RC211V MotoGP racer, this new 'Centre-Up' exhaust system snakes directly under the engine, then up and over the rear tyre to nestle its large-capacity stainless steel 'inverted isosceles trapezoid'-shaped silencer in the specially sculpted space beneath the seat. Taken out of the airstream, the turbulence and related air resistance associated with side-mounted pipes is eliminated, while nothing is left to get in the way of maximum cornering clearance. An elegant solution to several design problems, and an exclamation point on the new CBR600RR's hyper-aggressive new look.

Colouring Concept

The new CBR600RR's stunning new bodywork leaves no mistaking its racing roots, and its close ties to Honda's winning RC211V MotoGP racer. To even more strongly emphasise this fact and further draw attention to the new 'RR's competitive intent, its bold Italian Red livery is strikingly contrasted by a large 'Wing Mark' colour scheme that borrows heavily from Honda's latest Works racing machines and has been adapted by most of the other top models in Honda's Supersport stable.

The RR will also be made available in a brilliant, shimmering pearlescent yellow, and an all-black version that is highlighted by a bare minimum of graphics to project a mean yet modern look of uncompromising power and thrilling performance that is certain to win hearts and minds—as well as races—in the new riding season.

Both versions also features a rich metallic bronze colouring on their undercowls and engine case covers that provides an attention-getting contrast to underline the CBR600RR's modern, machine-finished good looks.

Colours

- Italian Red (with Temple Black Metallic frame and Matte Moonstone Silver Metallic undercowl)
- Pearl Flash Yellow (with Temple Black Metallic frame and Matte Moonstone Silver Metallic undercowl)
- Black (with Temple Black Metallic frame and Matte Moonstone Silver Metallic undercowl)

Engine

The new CBR600RR is no mere styling exercise based on a higher-tuned version of the CBR600F's well known and highly regarded engine. Instead, its new 'RR' version powerplant was designed from the ground up to provide an all-conquering blast of track and street performance that will leave no mistaking who's riding with the winners in 2003. With a much more circuit-oriented mission dedicated to unrivalled racetrack dominance, the CBR600RR's development team concentrated on refining the fundamentals of high-performance engine design with a host of major improvements and new concepts forged in the fires of Superbike and MotoGP competition.

Interestingly enough, extensive testing of various combinations of bore and stroke sizes found that the current CBR's displacement figures were also ideal for the new 'RR's performance targets, so no changes were made to the engine's basic displacement figures, which remain the same as the current CBR600F. Instead, efforts were focused on achieving improvements in engine performance through both a smaller and lighter design, reduced mass and friction and more efficient combustion characteristics. This was ultimately achieved through two major changes in the engine's design.

A Narrower Profile

With the goal of achieving a major increase in cornering clearance and banking angle, the engine's width was reduced at the crankshaft through the repositioning of several key components. First, the crankshaft's starter gear was moved from its current location on the left, behind the ACG, to the right, which freed up room to move the ACG itself further inboard, and reduce the dimensions of its cover accordingly. The distance from the

engine centreline to the outer perimeter of the ACG cover was subsequently reduced by 21.5mm. This change alone, combined with a shift of the engine's centreline relative to the centreline of the frame, and the newly designed ACG and clutch covers with their deeply tapered underside corners, effectively narrowed the width of the engine to realise a significant 3° increase in bank angles for each side, while ensuring more than ample cornering clearance at all-out racing speeds.

A Shorter Engine Length

Another major goal in the new engine's design was to shorten its length, thereby freeing up space to lengthen the swingarm and move both engine and rider forward—closer to the steering head and closer to the machine's overall centre of mass—in a quest for quicker, more responsive manoeuvring and sharper, more assured cornering control.

Until now, the most conventional approach to crankcase construction has been to line up all the major shafts in a row along the dividing line between the upper and lower halves of the horizontally split cases; a design that greatly facilitates crankcase assembly. However, this basic design also inherently places limits on the length to which the cases can be shortened, as all the interim gears positioned between the crankshaft and the final countershaft have fixed diameters that can't be made any smaller.

In order to free-up room to move the case-mounted swingarm pivot closer to the crankshaft, the CBR600RR's engine design team raised the centrally positioned main shaft 48.4mm above the case centreline. This permitted the countershaft to be moved closer to the crankshaft in a triangulated layout which resulted in a 30mm reduction in the distance between the crankshaft and the rear swingarm pivot.

To further enable the new engine to be positioned 9mm farther forward, the cylinder head's exhaust ports were angled downward a full 30° compared to the current CBR600F's engine to allow the exhaust system to curve in closer to the front of the engine, effectively shortening the engine at the front, as well.

This shorter engine length subsequently permitted the swingarm to be extended in length by 43mm for more progressive suspension operation and reduced stresses on the drive chain through the swingarm's range of movement.

Lightweight, New 'Slipper' Pistons

Minimising reciprocating weight and mass were also important goals in design of the new CBR600RR's engine in the quest for both higher rpms and higher power while maintaining top reliability. The engine's new skirtless forged 'slipper' pistons are significantly shorter and 15g lighter than the pistons currently used by the CBR600F and F/S. Each piston's set of advanced, lightweight and—at 0.8mm thickness for the top ring—ultra-thin rings boast superior resistance to power-robbing flutter at high velocities, and to blowby when high piston speeds meet high compression—characteristics augmented by the Honda-developed PMC (Powdered Metal Composite) aluminium/ceramic cylinder sleeves in which these pistons slide. For further minimised reciprocal weight, the pistons are mounted to the ends of their connecting rods by way of shorter, smaller diameter, and 8g lighter tool steel wrist pins.

'Nutless' Connecting Rods

Connecting rods also play a big part in helping to achieve peak power-producing engine speeds, and excessive weight or mass here slows response and acceleration while introducing vibration and stress that can adversely affect operation at higher rpms. The new CBR600RR's connecting rods feature a lighter 'Nutless' design first pioneered on the VTR1000F and VTR1000 SP-2, which use standard threaded bolts screwed directly into tapped holes in the body of the rod, instead of the conventional nut and bolt combination used in most rods to hold their endcaps in place. Requiring only one tool to assemble, the new design is 12g lighter than the conventional bolt and nut combination, for a total weight savings of approximately 35g per cylinder, or 140g overall. This significant reduction in reciprocating weight makes a major contribution to reducing the engine's mechanical load to help the new CBR600RR achieve a much more aggressively sharp feeling of responsive acceleration.

The RR's new connecting rods have also been carburised for an ultra-hard outer surface that ensures an optimal balance of strength and durability over the course of riding and racing extremes.

The end result of these improvements is a quicker-revving engine that produces strong power throughout its wide rev range and almost instantaneous bursts of blistering acceleration.

New Dual-Pivot Camchain Tensioner

At the howling top revs that the new CBR600RR's engine was designed to reach, concerns about precise cam timing and reliability come sharply into play. One main component that plays a crucial role in the CBR's valve drivetrain operation is its cam chain. At revs approaching 15,000rpm, not to mention the violent thrashes of acceleration and deceleration a motorcycle is exposed to over the course of a road race, the camchain comes in for

especially hard punishment. Conventional spring-loaded camchain tensioners simply aren't up to job of maintaining steady pressure and tension on the chain under these conditions, so the CBR600RR's engine designers countered this potential problem with a simple yet ingeniously effective dual-pivot tensioner system.

Featuring a new two-piece configuration, the long standard camchain guide that extends upward from just above the crankshaft gear is now held by a short overlapping secondary guide that gives the tensioner preload spring much greater leverage to hold the chain steady under racing's violent stresses, and maintain precise valve timing throughout the new engine's ultra-wide power band.

Next-Generation Dual Sequential Fuel Injection System (PGM-DSFI)

Fuel and air management has come a long way in a few short years, with the latest fully mapped and digitised fuel injection systems not only providing quicker starts, sharper response and more powerful performance, but achieving all this while consuming far less fuel and releasing far less in the way of harmful exhaust emissions. Great strides have also been made in delivering smooth and steady low-speed performance for smaller, mid-displacement engines, with comfortably linear control in the lower revs making a major contribution to easier driveability in urban traffic conditions.

However, while current systems provide excellent performance for most on-road riding applications and engine speeds, the new CBR600RR was, from its inception, intended to deliver strong power all the way up to a blazing 15,000rpm power peak. At such engine speeds—and incredibly short intake and exhaust stroke intervals—the limits of current fuel delivery system configurations were soon found. Specifically, while fuel injected into the intake ports at close proximity to the opening valves does provide excellent response and strong power output at low-to-midrange operating speeds, at higher intake velocities the fuel spray simply doesn't have enough time or distance to fully atomise and adequately mix with the in-rushing air to provide the optimum air/fuel mixture needed for efficient combustion, and thus strong power output.

To counteract this phenomenon, the CBR's engine design team first tested and then installed another full set of four 12-hole injectors, positioning them high in the roof of the airbox. This second set of injectors has been programmed to only operate when the throttle is opened wide at engine speeds of approximately 6,000rpm, resulting in a significant boost in fuel intake and combustion efficiency at high speeds.

Opening a tiny fraction of a second before the main injectors on each intake stroke, this auxiliary set of injectors primes the air rushing into the velocity stacks of the lower throttle bodies with a more finely atomised spray of fuel. This highly accelerated air/fuel mixture is further enriched by the normally timed injectors installed in the new larger throttle bodies (up from 38 to 40mm), which release a precisely modulated volume of fuel into the mixture rushing into the combustion chambers to ensure stronger, more complete combustion at high engine speeds.

In order to realise the much higher-accuracy sequential control needed to effectively operate this total of eight injectors at the RR's ultra-high engine speeds, a new ECU system was also required. This newly developed 32-bit processor-based system replaces the 16-bit processor used in the current CBR600F's fuel injection system to achieve phenomenally higher speed operation and accuracy for top performance all the way to the engine's breathtaking redline.

Another important benefit of this new system is that the pre-charged induction also significantly cools the air flow through the throttle bodies and intake ports, resulting in a much denser charge of air/fuel mixture into the chambers than could otherwise be achieved in a normally aspirated engine at such a blazingly fast intake stroke interval—at 15,000rpm, a mind-boggling 125 openings and closings of each intake and exhaust valve every second.

The end result of this new injection system—coupled to the CBR600RR's smaller and lighter engine—is hotter and stronger combustion, and sharper, more responsive acceleration for stronger performance throughout its wider powerband, as well as a breathtaking boost in peak power output.

Low Emissions for Environmental Protection

The new CBR600RR is also equipped with Honda's latest secondary Air Induction system. Featured on most of Honda's larger displacement motorcycles, this system complements the precise metering of its advanced fuel injection system with the introduction of an extra charge of fresh air into the exhaust ports on the exhaust stroke to extend the burning of exiting exhaust gases into the exhaust port, thereby ensuring more complete combustion and reducing pollution emissions to a level that easily complies with EURO-1 regulations.

CBR600RRs destined for Germany will further be equipped with Honda's advanced HECS3 oxygen-sensing catalyser system to ensure full compliance with current EURO-2 emissions regulations. Performance differences between the two versions will be minimal, and virtually unnoticeable to even the most discerning rider.

Chassis

Besides high power and light weight, perhaps the most fundamental factor affecting the design and optimum performance of any sports-oriented motorcycle is the way its weight is distributed. Since motorcycles, unlike cars, bank and turn around two axes—an ‘earthbound’ variation of the roll and yaw characteristics one associates with aeroplanes—any excessive weight or mass positioned near the machine’s outer extremities exerts a strong inertial influence on—and resistance to—its ability to swiftly lean and change direction. Thus, nearly all recent racing machines and many high-performance Supersport motorcycles have come to be designed with a growing emphasis on the concept of mass centralisation.

Every part—from lighter wheels and suspension components to such seemingly trivial details as the substitution of plastic for glass in a headlight’s construction—has a significant effect on a motorcycle’s ability to respond to its rider’s inputs with smooth and quick directional changes, and this influence grows as speeds increase. Extensive efforts made to move heavier components—including the rider—closer to the motorcycle’s rolling centre of mass, and to lighten those components positioned furthest from the central radial axes result in quicker, surer, more responsive handling while emphasising the rider’s feeling of close integration with the motorcycle.

Like the RC211V from which it receives its primary design influence, the totally new CBR600RR features a more compact form designed primarily for racetrack dominance. Its uniquely constructed new frame, innovative chassis layout and advanced, MotoGP-class suspension system combine to provide an unprecedented level of performance and almost paranormal

response that will soon be shedding seconds off lap times from Suzuka to Silverstone.

New, RC211V-Based Frame Design

Specifically designed to achieve smaller dimensions and more centralised mass, the CBR600RR's frame positions the rider closer to the steering head and almost directly above the machine's centre of mass, a position made possible by a total rethinking and redesign of the CBR's fuel tank. While overall frame rigidity is comparable to the current CBR600F and F/Sport, lateral rigidity around the steering head was increased to better stand up to the stresses put upon it by the front suspension as the bike flicks from side to side.

While high rigidity is certainly an important aspect of frame design, too much rigidity in the overall frame can sometimes result in a rough ride and imprecise cornering control, especially over uneven road and track surfaces. With this in mind, the RR's torsional rigidity was reduced slightly near the centre of its frame to lighten and ease handling in quick manoeuvres, and enhance wheel tracking to help the machine better settle into its line through the corners.

The end result of these modifications and improvements is the quickest and surest side-to-side cornering and smoothest handling ever experienced in a street-going road bike—and the most dynamic mix of lightning response and near-transcendental cornering control ever achieved in a circuit-scraping race bike of any class or displacement.

The secret to this remarkable handling prowess lies in its revolutionary frame construction.

Innovative Welded Hollow Die-Cast Frame

Modern leading-edge chassis production for the highest performance Superbike and Supersport motorcycles on the market has for quite a few years now been based on a precisely configured combination of aluminium

extrusions, castings, pressings or forgings welded together in the frame's construction. The CBR600F, among other leading Supersports in the Honda stable of race-ready streetbikes, has also been a prime recipient of this leading technology.

Now, in a quantum leap that represents the culmination of years of research into metallurgy and frame production technologies, Honda introduces a revolutionary new development in aluminium casting technology for frame production. Completely unlike the extruded aluminium main spars of Honda's leading Supersport machines till now, the new CBR600RR features freely formed, hollow-section unit die-cast aluminium frame sections welded between its die-cast aluminium steering head and pivot plates.

While the world's first application of open channel Fine Die-Cast technology can be seen in the production of the current CBR600F and F/Sport's pivot plate frame sections, the new CBR600RR takes this technology another quantum leap into the future with the first successful mass production application of leading-edge Hollow Fine Die-Cast technology. Used in the production of the main structural components of a motorcycle, this revolutionary advance not only realises the ideals of strong, lightweight construction, but also opens the door to new worlds of creative freedom with more organic structural shapes that can take full advantage of aluminium's light weight, strength and structural flexibility.

The process is based on conventional injection sand casting techniques, which are more often used in the production of solid objects in an infinite array of shapes and sizes. Casting larger, more complicated shapes, like frame sections has always been possible, but never before in such thin-walled hollow configurations, owing to the crumbling of the sand-formed

interior mould sections (*'sunanakago'* in Japanese casting industry terminology) as the molten aluminium is injected into the mould.

In a new development in the die-casting process, Honda succeeded in coating these *sunanakago* in ceramic, which helps them retain their shapes even when exposed to the high temperatures and pressure of the aluminium injection process. Then, after the aluminium cools and hardens, these internal casting sections can be easily broken up and removed from the hollow interiors of the frame sections, leaving only a smoothly dimpled finish and achieving an unprecedented thin wall thickness of only 2.5mm—where before the thinnest possible cast wall thickness had been 3.5mm—which makes a significant contribution to the frame's lighter weight, not to mention its unique configuration.

The new CBR600RR's revolutionary new hollow die-cast aluminium frame is constructed of nine pieces (1 steering head, 2 engine hangers, 2 pivot plates, and 4 interconnecting sections), all welded together to form one solid, organic whole. Die-cast aluminium has, until very recently, been extremely problematic to weld, since any foaming or other imperfections in the molten aluminium during the high-speed, high-pressure injection process can trap moisture and air bubbles in what are known in the industry as 'blow holes.' When later exposed to the instantaneously high temperatures of welding, these blow holes furiously sputter and pop, resulting in flawed welds, ugly surface imperfections and possibly impaired structural strength.

Honda solved this potential problem through the development of its new *sunanakago* Fine Die-Cast technology and the precise control of both the temperature of the molten aluminium and the speed of the injection flow,

which was slowed just enough to ensure flawless castings with no imperfections that might adversely affect weld strength.

New Die-Cast Aluminium Seat Rails

The CBR600RR's frame is not the only component to see the results of Honda's new Fine Die-Cast construction. Remarkably, even its seat rails received this treatment in order to create a simply constructed yet lightweight and structurally strong, organically designed mount for both rider and rear tail cowl assembly that perfectly surrounds the CBR's large, new, centrally positioned exhaust system while providing optimum strength and rigidity.

A conventional welded steel or aluminium seat rail, constructed primarily for lightness and strength, would require that the CBR's underseat exhaust system be bent to fit its narrow design parameters, and as a result would likely have an adverse affect on engine performance.

Instead, the CBR's new casting process allows the seat rails to be formed to a custom fit around the silencer's optimum positioning and trapezoidal shape while at the same time greatly reducing manufacturing time and costs by only requiring five pieces in its construction: the two rails mounted to the frame and three bolted-in cross-members that provide assured lateral strength and rigidity. The two rails themselves curve inward to bolt together at the rear to meet around the rearmost cross-member, providing added structural strength without the need for expensive, time-consuming welds. This modular design also facilitates maintenance while reducing weight.

New Centrally Positioned Fuel Tank

Perhaps the most impressive change in the new CBR600RR's layout, albeit the least visible, is the complete redesign and repositioning of its fuel tank.

One of the major challenges (and frustrations) for high-performance motorcycle designers has always been to find the ideal position to carry a full

tank of fuel on a motorcycle—and have it still look like a motorcycle. The traditional location over the engine—although often one of the most attractive points of focus in a motorcycle’s design—invariably concentrates a large lump of shifting/sloshing inertial weight at the highest point in the bike’s form. And with a full charge of 18 litres weighing in at approximately 710 grams per litre, that adds up to a hefty sum of nearly 13kg that the laws of physics decree will be resistant to any rapid side-to-side changes of direction. This high-positioned load of mass and weight represents one reason road racers find the last laps of a race much quicker and easier-handling than the first laps, owing to the unsettling way that this large can of fuel affects handling and slows cornering response.

Under the new CBR600RR’s sleekly designed and conventionally proportioned fuel tank cover resides an entirely new idea in weight and mass apportionment. The forward half of the space under this cover is taken up by the induction system’s large 6-litre aircleaner assembly, with its Dual Sequential Fuel Injector system installed within. The rear half—closest to both the rider and the motorcycle’s centre of mass—is taken up by the fuel tank, exactly like the revolutionary new RC211V. However, only the upper third of the pressed steel fuel tank is visible over the upper rails of the frame. Below that, reaching far down to the upper surface of the engine’s crankcase, lies the major bulk of the new CBR600RR’s fuel capacity, carried as close as possible to this race-ready machine’s centremost turning axes.

The impressive result of this fundamental change in design is two-fold. First, the change in fuel tank shape permits the rider’s seating position to be moved a full 70mm forward relative to the steering head, resulting in a smaller form with its mass more effectively centralised around its rolling axes. Next, the centralised positioning of the fuel’s weight results in a lighter

and more responsive handling feel that enhances quick changes in direction while remaining essentially neutral, regardless of how much fuel it is carrying.

Suspension

The new CBR600RR's suspension components have also been refined, reworked, or even totally replaced in line with its new focus on all-out racing prowess.

New 45mm Cartridge-Type Front Fork

Illustrating the seriousness of Honda's intent in remaking the new CBR600RR into a potent and all-conquering race-ready Supersport, its front wheel is now carried by the largest diameter standard cartridge-type forks Honda has mounted on a motorcycle since the advent of the legendary NR. At 45mm, these fully adjustable forks feature an HMAS cartridge configuration similar to the CBR RR Fireblade and VTR1000 SP-2, which employs a unique damping force control system for significant improvements in damping characteristics and tracking response to match the requirements of the most aggressive racetrack assaults with precision control and airtight handling.

New 'Works'-Based Hybrid Swingarm

Mounted directly to the rear case of its powerful engine, the CBR600RR's impressive, new hybrid aluminium swingarm is also derived directly from Honda's MotoGP and Superbike racing efforts. Featuring a huge, highly rigid, yet remarkably lightweight press-forged and welded right-side arm welded to a large cast aluminium cross-member, and a large, *Yagura*-braced box-section extrusion on the left, this new design is not only stronger and more resistant to the torsional stresses of intensive road and track riding, it is also amazingly lighter and more rigid than the 'smaller' CBR600F swingarm it replaces, realising significantly enhanced cornering control

which will surely prove to be a major advantage in the high-speed world of Supersport racing.

Innovative, New 'Unit Pro-Link' Rear Suspension System

Based entirely on the compact system supporting the rear swingarm of the dynamic, new RC211V, the CBR600RR's unique Unit Pro-Link rear suspension system is entirely self-contained within the swingarm it supports, with no connection to the main frame, save for the lower arms providing an anchor for its newly configured Delta Link. This innovative new design totally isolates the frame and steering head from the shocks and stresses exerted on the rear wheel and suspension under spirited riding and racing extremes, and makes a significant contribution to the CBR600RR's total mass centralisation, and by extension its sharper, more responsive handling.

The damper's upper mount, previously attached to the frame's upper rear crossbar, is now held in place by a bolted-on mounting bracket installed in the upper surface of the swingarm's massive pivot section. The damper's prominent remote gas reservoir is positioned within easy reach for quick adjustments of compression and rebound damping.

Race-Ready Wheels and Brakes

The CBR600RR's new triple-spoke cast aluminium wheels feature remarkably compact hubs for an ultra-lightweight design. Intensive efforts were also made to reduce rear wheel weight, which combine to achieve the lighter weight and more centralised mass required in such a high-performance road and track machine.

The new RR's sure-stopping brakes are also some of the best in the business, with a pair of powerful and responsive four-piston callipers like

those used on Honda's pre-eminent Supersport flagships, the FireBlade and VTR SP-2, gripping larger-diameter new 310mm rotors (up from the CBR600F's 296mm discs) between fade-resistant sintered metal pads. These larger new floating discs are attached to their spare, lightweight inner rotors with ten anodised aluminium pins each, up from the seven pins used to assemble the CBR600F's front brakes. At the rear, a lightweight single-piston calliper mounted under the swingarm grips a 220mm disc between sintered metal pads for a supremely confident balance of braking performance on par with the world's most narrowly focused and highly competitive racers.

Equipment

Lightweight New Instrument Panel

The CBR600RR's compact, fully electronic instrument panel is one of the slimmest and lightest ever mounted on a street bike. Surrounding its large, central dial-type tachometer are a large LCD on the right incorporating digital displays of speed, dual trip and related warning indicators, and a smaller LCD on the left providing a 7-segment fuel gauge and a digital coolant temperature readout. Brilliant LED indicator lights with ISO markings are positioned around the perimeter of the panel.

Startup Routine

The instrument panel's fully electronic display also allowed the RR's design team to add some eye-catching fireworks to the normally bland startup routine. The instant the key is placed in the ignition, the CBR's H.I.S.S. security system confirms that the correct key has been inserted. When switched on, all the LED indicator lights momentarily switch on as the tachometer needle jumps around to maximum scale and the speedometer flashes to a maximum readout of 288km. In the following brief interval, as the fuel pump audibly comes online, the tachometer needle winds back down to zero as the speedometer also counts down to zero. Following this 'welcome,' the engine can be started normally.

Honda Ignition Security System (H.I.S.S.)

Honda's highly capable H.I.S.S. anti-theft system features a fail-safe electronic interlock that prevents the engine from being started in any other way than using the motorcycle's two original keys. Totally disabling the

engine at the very heart of its ignition system, the system cannot be bypassed by either hot-wiring the ignition or exchanging the ignition switch module, thus effectively deterring joyriders and greatly reducing the possibility of ride-away theft.

Like most of the other machines in the Honda Supersport lineup, the CBR600RR's system features a red warning LED built into its instrument panel that visually warns-off potential thieves by constantly blinking at a 5-second interval for a period of 24 hours, then switching off while the Ignition Security system itself remains fully active and alert. A large, diamond-shaped H.I.S.S. sticker on top of the fuel tank cover clearly indicates the presence of this highly effective security system, providing a strong message for would-be bike thieves to look elsewhere for easier pickings.

Optional Equipment

The CBR600RR will also be released with an assortment of optional parts that have been specially designed and produced by Honda Access Corporation to improve upon aspects of its road and track performance.

These include:

- A slip-on moulded plastic pillion pad seat cowl that clicks into place to give the new CBR600RR a more singularly sporty and purposefully competitive look on par with its new level of performance.
- A specially selected U-lock designed to fit into the compact U-lock carrier space located under the pillion pad.
- Adhesive black rubber fairing protectors with aluminum inserts protect the under part of the fairing from scratches.
- A water-resistant yet breathable cover protects the CBR600RR's paint and bodywork from the elements while allowing it to dry when covered. A lower draw rope allows the cover to be tightened to avoid fluttering, which could damage paint. Two holes built into the lower front area of the cover allow a U-lock to be attached.
- The rear paddock stand facilitates bike cleaning and rear wheel maintenance.

Optional HRC Racing Kit

As it has for the VTR1000 SP-2 and many of Honda's other production motorcycles that vie in amateur and world-class racing competition, Honda Racing Corporation (HRC) is releasing an extensive array of specialised racing parts for the CBR600RR. This complete racing kit includes engine, chassis, suspension and body parts designed for stronger power, lighter weight, sharper handling and better aerodynamics to hone the new RR's capabilities to a finely tuned competitive edge, and focus every aspect of its performance potential on the twin goals of competitive World Supersport racing capability and ultimate victory.

Specifications

CBR600RR (ED-type)

Engine

Type	Liquid-cooled 4-stroke 16-valve DOHC inline-4
Displacement	599cm ³
Bore x Stroke	67 x 42.5mm
Compression Ratio	12 : 1
Max. Power Output	86kW/13,000min ⁻¹ (provisional data)
Idling Speed	1,300min ⁻¹
Oil Capacity	3.5 litres

Fuel System

Carburation	PGM-DSFI electronic fuel injection
Throttle Bore	40mm
Aircleaner	Dry, cartridge-type paper filter
Fuel Tank Capacity	18 litres (including 3.5-litre warning light reserve)

Electrical System

Ignition System	Computer-controlled digital transistorised with electronic advance
Ignition Timing	Independent 4-cylinder 3D-mapped computer control
Sparkplug Type	IMR9C-9H (NGK); VUH27D (ND)
Starter	Electric
Battery Capacity	12V/8.6AH
ACG Output	333W
Headlight	12V 55W x 1 (low)/55W x 1 (high)

Drivetrain

Clutch	Wet, multiplate with coil springs
Clutch Operation	Mechanical; cable-actuated
Transmission Type	6-speed
Primary Reduction	2.111 (76/36)
Gear Ratios	1 2.666 (32/12) 2 1.937 (31/16) 3 1.661 (29/18) 4 1.409 (31/22) 5 1.285 (27/21) 6 1.666 (28/24)
Final Reduction	2.625 (42/16)
Final Drive	O-ring sealed chain

Frame

Type Diamond; twin-spar cast aluminium

Chassis

Dimensions (LxWxH) 2,065 x 685 x 1,135m m
Wheelbase 1,390mm
Caster Angle 66°
Trail 95mm
Turning Radius 3.2m
Seat Height 820mm
Ground Clearance 135mm
Dry Weight 169kg (provisional data)

Suspension

Type Front 45mm fully adjustable HMAS cartridge-type telescopic fork, 120mm axle travel
Rear Unit Pro-Link with gas-charged remote reservoir damper, adjustable spring preload and compression and rebound damping, 120mm axle travel

Wheels

Type Hollow-section triple-spoke cast aluminium
Rim Size Front 17 x MT3.50
Rear 17 x MT5.50
Tyre Size Front 120/70 ZR17 (58W)
Rear 180/55 ZR17 (73W)
Tyre Pressure Front 250kPa
Rear 290kPa

Brakes

Type Front 310mm dual hydraulic disc with 4-piston callipers, floating rotors and sintered metal pads
Rear 220mm hydraulic disc with single-piston calliper and sintered metal pads

All specifications are provisional and subject to change without notice.