



Press Information 2000



VFR



VFR

Introduction

Honda's proud and popular VFR has been renowned for years as a showcase for many of Honda's most advanced motorcycle technologies. From its powerful DOHC V4 engine to its perimeter-style dual-spar aluminium frame and impeccable quality of craftsmanship, the VFR has consistently incorporated the best that Honda has to offer.

The year 1998 saw the VFR completely revamped with more than just new styling. Its high-powered new engine is based on the one that has carried Honda's famous RVF/RC45 to a long string of racing victories, while its innovative 'pivotless' frame separates the steering head from the engine-mounted swing arm in an advanced and lightweight design. Advances in aerodynamics permit the VFR's radiators to be mounted at its sides rather than in front, as in conventional liquid-cooling systems, for more effective cooling and a more compact design. The VFR's

new-generation Dual Combined Brake System is simpler, lighter and more compact than its earlier generations, offering refined braking control. And the first-time introduction of Honda's innovative new HECS3 emissions control system provides irrefutable evidence of Honda's longstanding efforts to minimise the motorcycle's impact on our fragile environment. As technological breakthroughs have risen to meet the challenges of the times, it was felt that the time was right to introduce the low-emissions VFR to a wider range of users.

However, rather than simply swapping the new system for the old, the VFR's design team felt it important that the new low-emissions version provide all the power and performance of the 'standard' version it would be replacing, while offering more on the side to further increase its inherent desirability. The team thus set about to refine the VFR's HECS3 low-emissions system and explore further improvements to assure the VFR's place as Honda's technological performance flagship.





VFR

Development Concept

For the year 2000, the VFR further consolidates its position as the performance and technology leader of the 750cc class. Carefully conceived improvements made to its HECS3 low-emissions system ensure that the engine performance is strong enough to justify its inclusion in every version of the VFR to be made for Europe—as well as the rest of the world. In fact, the VFR's performan-

ce is not merely 'strong enough,' but stronger overall, and with lower exhaust emissions and lower fuel consumption than the current model, never mind any other comparable sized motorcycle available till now. On top of the exceptional improvements made in the efficiency of its low-emissions system, the VFR also features such improvements as a new automatic bypass starting system

that ensures quick and easy starts and smooth operation in even the coldest weather conditions, and a new Honda Ignition Security System (H.I.S.S.) to protect against potential theft. As Honda's proud technological flagship, the VFR leads the way with an uncompromising concern for the environment, safety and all-round riding enjoyment. Nothing else compares.





VFR

Colouring Concept

Colouring Concept

The new, Year 2000 VFR charges into the new millennium in three gorgeous colour variations that accentuate its distinctive position in the sport bike scene. A new pearlescent green leads the trio with a darkly luxurious hue that offers wide-ranging appeal to riders of all ages. This is followed by a lush

candy blue that exudes a crisp, modern feel to emphasise the VFR's innately sporty character. And finally, carrying over from the previous year is the colour most strongly identified with the VFR, a dynamic electric red that embodies all the VFR's sport riding dynamics and aggressive performance.

Colour

- Italian Red
- Pearl Conifer Green
- Candy Tahitian Blue





VFR

Engine

In order to provide the power and performance required to allow the HECS3 low-emissions system to be included standard on every version—or the only version—of the VFR to be released in the year 2000 and onward, the VFR's design team restudied the effects of the PGM-FI fuel injection system on catalyser efficiency and its related emissions output. Since all factors in the system are closely interrelated in a critical balance of performance, any changes made to one aspect can have major repercussions elsewhere that may not be so easily compensated for.

The pivotal key to the difference in the performance of the VFR's 'standard' and HECS3 configurations could be found in the design of the exhaust system, particularly in the vicinity of the catalysers themselves. To work at optimal efficiency, the catalysers must reach a certain temperature threshold that permits their catalytic elements to function properly. This is especially important at start-ups, and can be a problem in very cold weather conditions,

since the catalysers are positioned relatively far away from the engine and therefore take longer to reach their optimal operating temperature.

The exhaust system for the current HECS3 system overcomes this problem by using narrower tubing to help accelerate this pre-heating process. This may be a competent fix, but the smaller tubing has the additional effect of restricting maximum power output somewhat,

so the HECS3 version of the VFR ended up being approximately 8PS down in maximum power compared to the standard version. While not a major drop in power, and certainly better than any catalyser system developed until now, this was not what the VFR's design team was hoping to achieve. The solution to this problem came in the form of a new development made for the CBR1100XX Super Blackbird's fuel injection system.





VFR

Engine

New Automatic Bypass Starter

Extremely cold temperatures can often cause oil to thicken, mechanical friction to increase and injected fuel vapour to condense along inside walls of carburettors or fuel injector bodies. These symptoms often combine to impede cold weather starting, and make initial warm-up operation extremely rough and irregular, with frequent stalls and fitful performance until the engine reaches its optimal operating temperature.

To effectively combat this problem, the VFR's advanced fuel injection system now features the addition of a new automatic bypass starter system that ensures smooth performance and

quick starts in virtually all weather conditions. Introduced last year on the CBR1100XX Super Blackbird, this new automatic bypass starter opens new internal air passages designed into each throttle body to deliver an extra shot of air that assists starting and increases idling speeds for quicker warm-up whenever coolant temperatures fall below 40° C. As the engine warms up, coolant circulates through the

throttle bodies to warm the fuel for optimal combustion, and through the bypass starter to actuate a small piston that gradually pushes out to close the auxiliary air passages. Completely automatic, this innovative and effective system ensures quick and simple starts, shorter warm-up cycles, steadier idling and smoother performance in all operating conditions.



VFR - 20006 - E



VFR

Engine

This system also combines with minor programming changes in the fuel injection system's new, higher-precision ECU to increase the idling speed and thereby accelerate the heating of the emissions system's catalysers. Because of this, larger diameter exhaust pipes could be used without affecting the catalysers' operating efficiency, resulting in a subsequent increase in maxi-

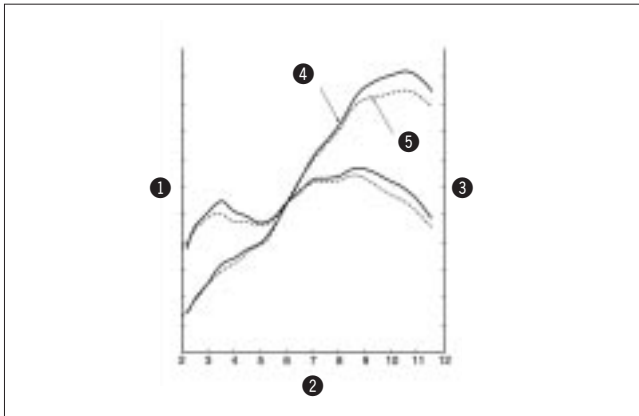
mum power output. Thus, even with its highly effective HECS3 low-emissions system installed, the new Year 2000 pan-European VFR attains a maximum output of 106PS, which is equal to the engine's output without the system installed. These modifications also resulted in a wider range of optimal low-emissions operation, thus permitting the system to effectively reduce

emissions even when the VFR is being ridden harder than usual. A further benefit of this system is its remarkable fuel efficiency. Not only does the new VFR offer better fuel economy than the current 'standard' model, but fully 12% better fuel consumption figures than the current HECS3 model.

Performance Characteristics Comparison

- ① Power Output (PS)
- ② Engine Speed (rpm)
- ③ Torque Output (kgf.m)
- ④ New VFR
- ⑤ Current Model

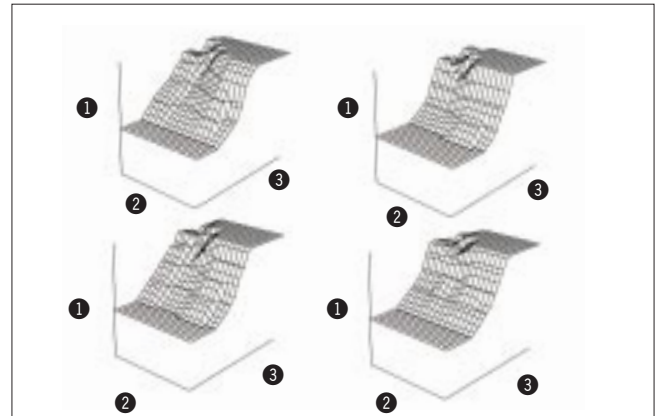
Performance Characteristics Comparison



Ignition Timing Map

- ① Spark Advance (deg.)
- ② Throttle Angle (deg.)
- ③ Engine Speed (rpm)

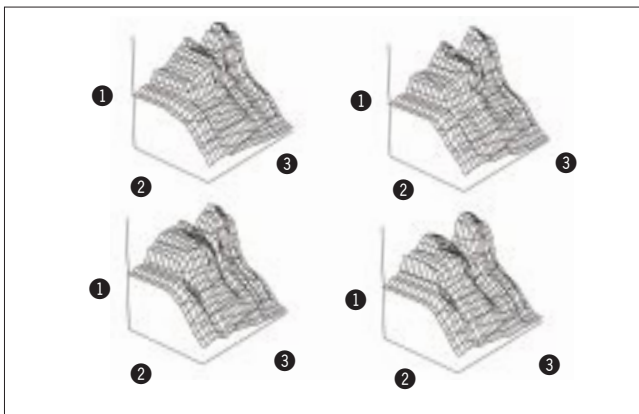
Ignition Timing Map



Fuel Injection Control Map

- ① Time (sec.)
- ② Throttle Position
- ③ Engine Speed (rpm)

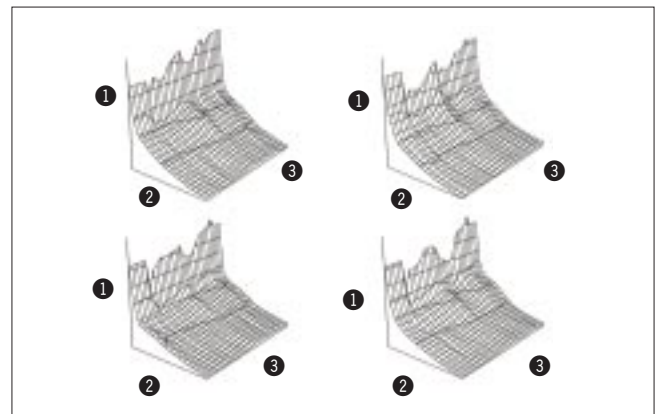
Fuel Injection Control Map



Intake Pressure Map

- ① Time (sec.)
- ② Intake Manifold Pressure
- ③ Engine Speed (rpm)

Intake Pressure Map





VFR

Engine

Lighter Clutch Operation

The VFR also received improvements to its clutch design that improve its operation. The piston ratio and spring rate of its master cylinder were changed and the number of its clutch plates was reduced from nine to eight, resulting in lighter action and smoother gear change operation.



VFR

Chassis

The VFR's superb twin-spar aluminium frame and high-performance Super Sport suspension systems were also inspected for areas of possible improvement. The only result of these efforts were a couple of minor modifications to the rear suspension's Pro-Link damper,

which received a new, higher durability rubber compound for the damper piston's O-ring and new urethane 'bump rubber' stoppers replacing the previous rubber compound for reduced shock should the suspension ever reach full-bottom.





VFR

Equipment

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

Noting the growing problem of motorcycle theft over the years, Honda has been making concerted efforts to build in developments that help its customers protect their investments. These efforts have resulted in convenient spaces for carrying strong 'U'-locks and chains, handy and effective lock-down points provided in frames and bodywork, and even ingenious mechanical toggle switches that lock a scooter's centrestand in its down position.

Last year, Honda introduced on several models its latest innovative in the fight against motorcycle theft: a new anti-theft ignition system that prevents the engine from being started by any other than the motorcycle's original two keys. Now named the Honda Ignition Security System, or H.I.S.S.

for short, this highly effective anti-theft system features a ruggedly built combination switch that helps resist mechanical tampering, and an electronic interlock between the special coded chips implanted in each of the two keys supplied with the motorcycle and the ignition system's electronic control unit (ECU).

A coil antenna built into the ring surrounding the upper edge of the key switch instantly detects the presence of an encoded key and transmits the key's code number to the ECU, which instantly checks the number against either of the two codes it is programmed to recognise. If the code matches, as indicated by a corresponding yellow LED on the meter panel lighting up, the engine can be started normally. However, if the key code does not match the ECU's programmed number, even if the key is identical in every other

way, the ignition remains switched off and the engine cannot be started. Also, since the engine is disabled at the heart of its ignition system, it cannot be bypassed by either hot-wiring the ignition or exchanging the ignition switch module.

While the VFR's anti-theft ignition system cannot protect the motorcycle against every possibility of theft, it does effectively prevent the motorcycle from being ridden away—one of the most common occurrences—thus making theft more difficult and time-consuming, and hopefully convincing potential thieves and joyriders to look elsewhere.

A bright yellow diamond-shaped H.I.S.S. sticker placed on the top of the fuel tank clearly indicates to potential thieves the presence of this highly effective new system.





VFR

Equipment

New Rear-View Mirrors

The VFR also features new mirrors with a rounder profile than on the current model. Their black-painted solid aluminium stays can be folded down out of the way for easier storage, and replace the flexible rubber-booted stays of the current model.

New Meter Design

The character font used for the numbers in the VFR's meters was changed to a more bold-faced italic type that offers easier visibility, especially for tired eyes during nighttime riding.



VFR - 200011 - E



VFR

Specifications

Specifications

VFR (ED-type)

Engine	Liquid-cooled 4-stroke 16-valve DOHC 90° V-4
Bore × Stroke	72 × 48mm
Displacement	781.7cm ³
Compression Ratio	11.6 : 1
Carburation	Electronic fuel injection
Max. Power Output	106PS/10,500rpm (95/1/EC) (78kW/10,500min ⁻¹) 110PS/10,500rpm (DIN) (81kW/10,500min ⁻¹)
Max. Torque	8.2kg-m/8,750rpm (95/1/EC) (80Nm/8,750min ⁻¹) 8.5kg-m/8,750rpm (DIN) (83Nm/8,750min ⁻¹)
Ignition	Computer-controlled digital transistorised with electronic advance
Starter	Electric
Transmission	6-speed
Final Drive	'O'-ring sealed chain
Dimensions (L×W×H)	2,095 × 735 × 1,190mm
Wheelbase	1,440mm
Seat Height	805mm
Ground Clearance	130mm
Fuel Capacity	21 litres
Wheels	Front 17 × MT3.50 'U'-section 6-spoke cast aluminium Rear 17 × MT5.50 'U'-section 5-spoke cast aluminium
Tyres	Front 120/70 ZR17 (58W) Rear 180/55 ZR17 (73W)
Suspension	Front 41mm H.M.A.S. cartridge-type telescopic fork with stepless pre load adjustment, 109mm axle travel Rear Pro-Link with 7-step pre load and stepless rebound-adjustable gas-charged H.M.A.S. damper, 120mm axle travel
Brakes	Front 296 × 4.5mm dual floating hydraulic disc with Combined 3-piston callipers and sintered metal pads Rear 256 × 6mm hydraulic disc with Combined 3-piston calliper and sintered metal pads
Dry Weight	210kg

All specifications are provisional and subject to change without notice.