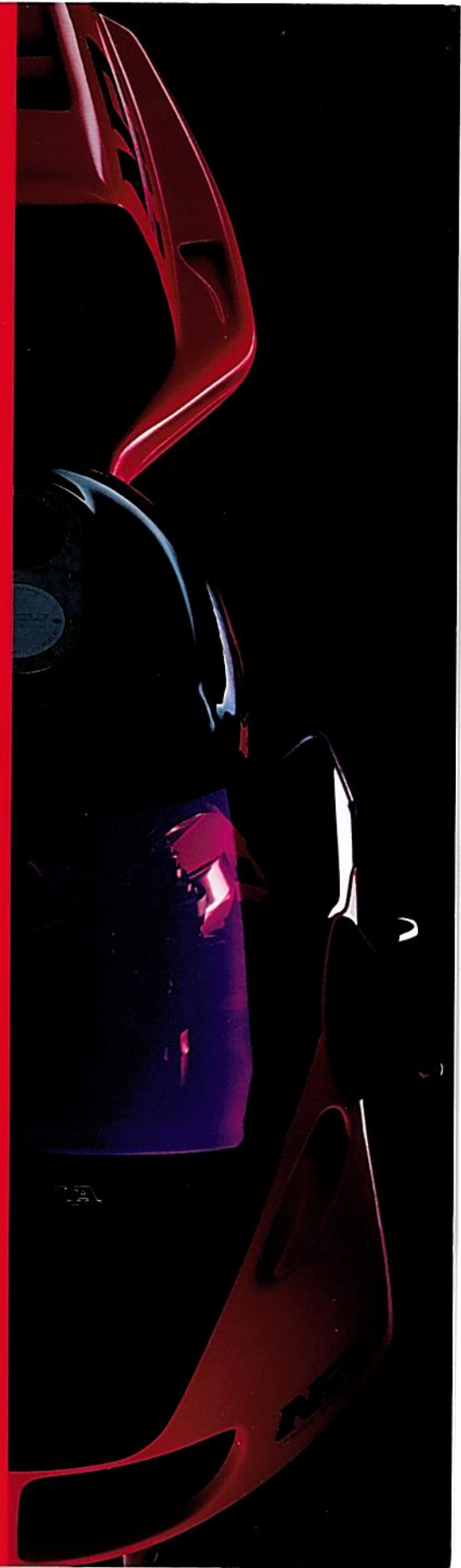


 **HONDA** *Come ride with us.*

NR

**There is no limit to the places a dream can carry you.
All it takes is the determination to get there.**







IN THE BEGINNING, THERE WAS THE DREAM...

At one time, there was only a dream. A dream of setting sail from the known world to seek new horizons and new discoveries. A dream, like many before, dismissed by the smug voice of authority as being foolhardy and fantastic. "The world is flat!" "Only birds can fly!" The paths of discovery are littered with the remains of "unassailable truths" that eventually crumbled before the power of the dream. Today, Honda consigns yet another "truth" to the dustbin of history: "The only shape for a piston is *round*."

Introducing the NR. With its fuel-injected oval piston V-4 engine and state-of-the-art technology, the NR flies in the face of conventional thinking to stand as a brave milestone in the history of engine and motorcycle development. A hallmark of Honda's advances in design and manufacturing expertise, and indisputable proof of the power of the dream.





The Revolutionary Oval Piston

The NR's remarkable oval piston engine is the historic result of an intensive twelve-year research and development programme directed towards perfecting an entirely new concept in 4-stroke engine design. The goal was a remarkably compact V-4 power unit with the potential for unprecedented power, torque, and linear response. But what did Honda hope to achieve by starting with such a seemingly odd piston shape?

One of the fundamental paths to achieving maximum power in an internal com-



bustion engine is optimising the flow of air through the combustion chamber. Although increased valve area is one proven means of improving breathing, the circular shape of the conventional piston automatically limits the surface area that can be covered by circular valves, whatever their size or number. In trying to find new ways to increase air flow, Honda's engineers found themselves returning again and again to the possibilities presented by the oval piston design.

The Benefits of the Oval Piston

The oval piston's most obvious benefit over a comparable pair of round cylinders is its greatly increased intake and exhaust efficiency. This is the result of the larger valve area made available by the oblong shape of the cylinder, as eight valves can be more closely spaced to cover an effectively greater portion of the total chamber head area. Also, as the circumference of the oval piston is fully 30% smaller than that for the comparable pair of round pistons, it makes possible a smaller cylinder (and overall engine dimensions), as well as a major reduction in sleeve-related friction.

Another major benefit is that, as the same displacement volume can be achieved with a much shorter piston stroke, the weight of reciprocating parts can be minimised, making possible astoundingly high engine speeds.

However, while these advantages may look good on paper, making them reality proved to be quite another matter. Entirely new manufacturing processes and technologies had to be developed before the theories behind the oval piston engine could

first be tested and refined, and its advantages finally realised. This applied not only to the creation of the piston itself, but also to the boring of its cylinder, the machining of its rings, and a host of other specialised manufacturing processes.

Dual Connecting Rods & Sparkplugs

The oval piston shape made it possible to double up on many of the components that contribute to a stronger, more reliable engine without also doubling such power-restricting factors as weight and friction.

Each cylinder features eight lightweight valves, two high-strength connecting rods, and two sparkplugs. The wide head, narrow stem valves are directly actuated by the cams, and are responsible for much of the cylinder's optimum breathing and combustion efficiency.

The NR's narrow 8mm sparkplugs were selected to maximise valve area and air flow within the oval pentroof combustion chamber, and ensure an even spread of highly efficient combustion throughout the chamber. The connecting rods are made of strong, lightweight, aerospace-grade titanium, which was further strengthened in an alloy with aluminium and vanadium. Fully 17% lighter than conventional rods of comparable strength, they help keep reciprocating weight to an absolute minimum.

High-Precision Cam Gear Train

With its astounding 15,000rpm redline, the NR requires the highest possible precision from all its mechanical assemblies to ensure optimal response, stability, and reliability. Its high-accuracy valve actuation comes by way of a gear-driven valve train

pioneered in the NR500 and used extensively in Honda's winning RC30 racers. All gears in the train have been made as slim as possible to minimise friction and weight, and Honda-developed split-tooth gears dramatically reduce gear-related mechanical noise.

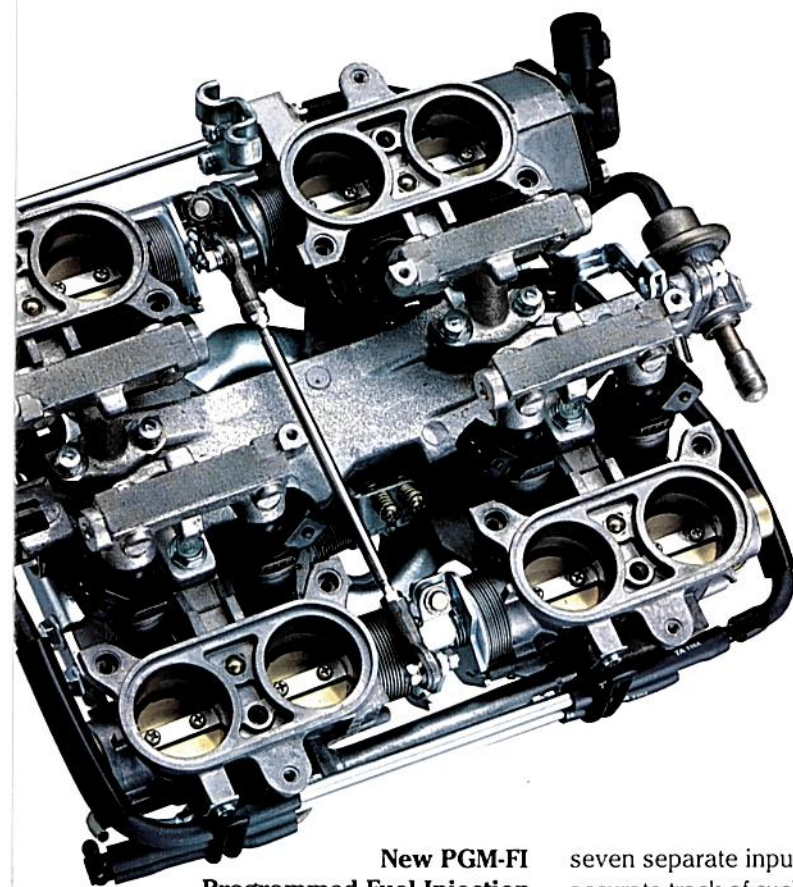
Maximised Intake/Exhaust Efficiency

As proven in Honda's high-powered racing engines, the shortest path to peak intake efficiency is also the straightest path to winning performance. To help achieve the NR's wide powerband and fast, linear response, all ports were made as short and straight as possible. This detail helps maximise the volume of air/fuel mixture flowing to the combustion chambers, while minimising intake resistance and inertia for more efficient charging and powerful performance.

A large-volume aircleaner ensures a steady, unrestricted flow of the cool, dense air a high-performance engine needs, and features a computer-controlled intake duct that regulates airflow to match engine speeds.

The free-flowing 8-into-4-into-2-into-1-into-2 exhaust system is constructed of rugged, heat-treated stainless steel tubing, and puts out a stirring exhaust note while staying well within the limits of noise regulations. The system's twin silencers are distinctively integrated into the seat cowl, where their combined volume effectively reduces exhaust resistance to ensure top performance and sharp, linear response.





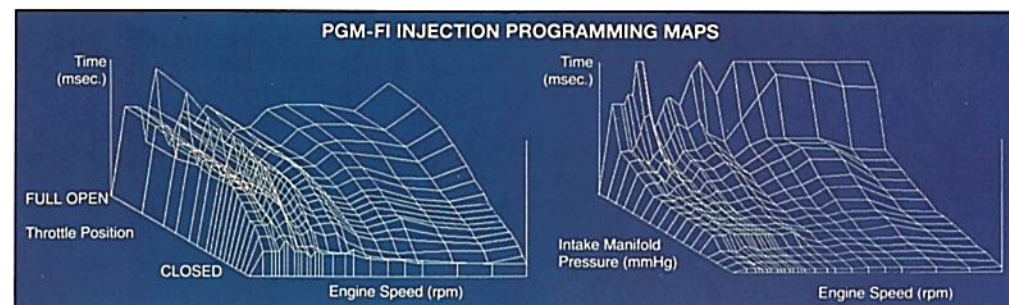
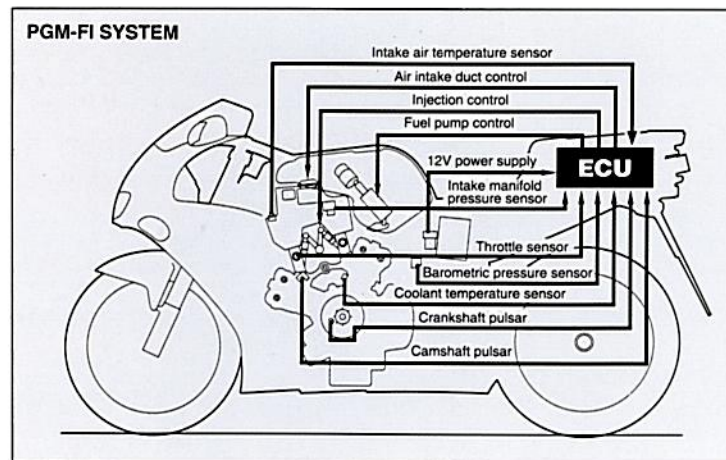
New PGM-FI Programmed Fuel Injection

For an engine built to this level of precision, nothing but the precision of electronic fuel injection could ensure the exact delivery of the air/fuel mixture for optimal performance under all operating conditions.

The NR's modular fuel injection assembly features a bank of no less than eight individual injectors feeding eight separate throttle bores, two for each cylinder, to provide the most precise metering of fuel input possible. The system is controlled by a 16-bit microprocessor ECU (electronic control unit) that continuously monitors

seven separate input sensors. These keep accurate track of such critical factors as cam and crankshaft positioning, ambient and intake manifold air pressure, intake air and coolant temperature, and throttle position.

Instantly processing this information, the ECU works in concert with the NR's advanced PGM-IG programmed ignition to determine the correct amount of fuel to inject into the cylinders and the exact ignition timing to realise dynamic performance under all operating conditions. The ECU also modulates the volume of air entering the intake by controlling a flap on the air-cleaner's intake duct.



Innovative Cooling System

The NR's liquid-cooling system breaks with conventional designs by first swirling coolant around the engine's biggest heat producers, the exhaust valves, before flowing on to the cylinders and other parts of the engine. The dual-element system uses a standard flat radiator and a curved *U-Vent* radiator working in series to provide maximum cooling efficiency. Both feature thermostat-regulated fans that help maintain efficient heat dissipation under all riding conditions.

The NR also features a high-capacity *U-Vent* oil cooler which was specially constructed to withstand the oil system's higher pressures and temperatures, and ensure stable performance and reliability.

High-Powered ACG, Compact Clutch

The NR's extensive electronic control hardware requires dependable electrical output from a high-powered ACG. However, as the excessive weight and mass of a conventional ACG would drastically slow

engine response, a more compact unit was specially developed for the NR. This high-performance ACG uses a new composition rare earth magnet for higher electrical output without the weight and other problems associated with larger ACGs.

To best take advantage of the engine's phenomenal torque, the NR's clutch has one of the largest total surface areas in its class. Incorporating a back torque limiter, it also provides smooth downshifts and dynamic acceleration through the corners.

Cassette-Type Transmission

The NR also features a cassette-type transmission similar to the units used in professional racing machines. It's one-piece unitary configuration simplifies maintenance by permitting quick, easy removal without having to remove or disassemble the rest of the engine.

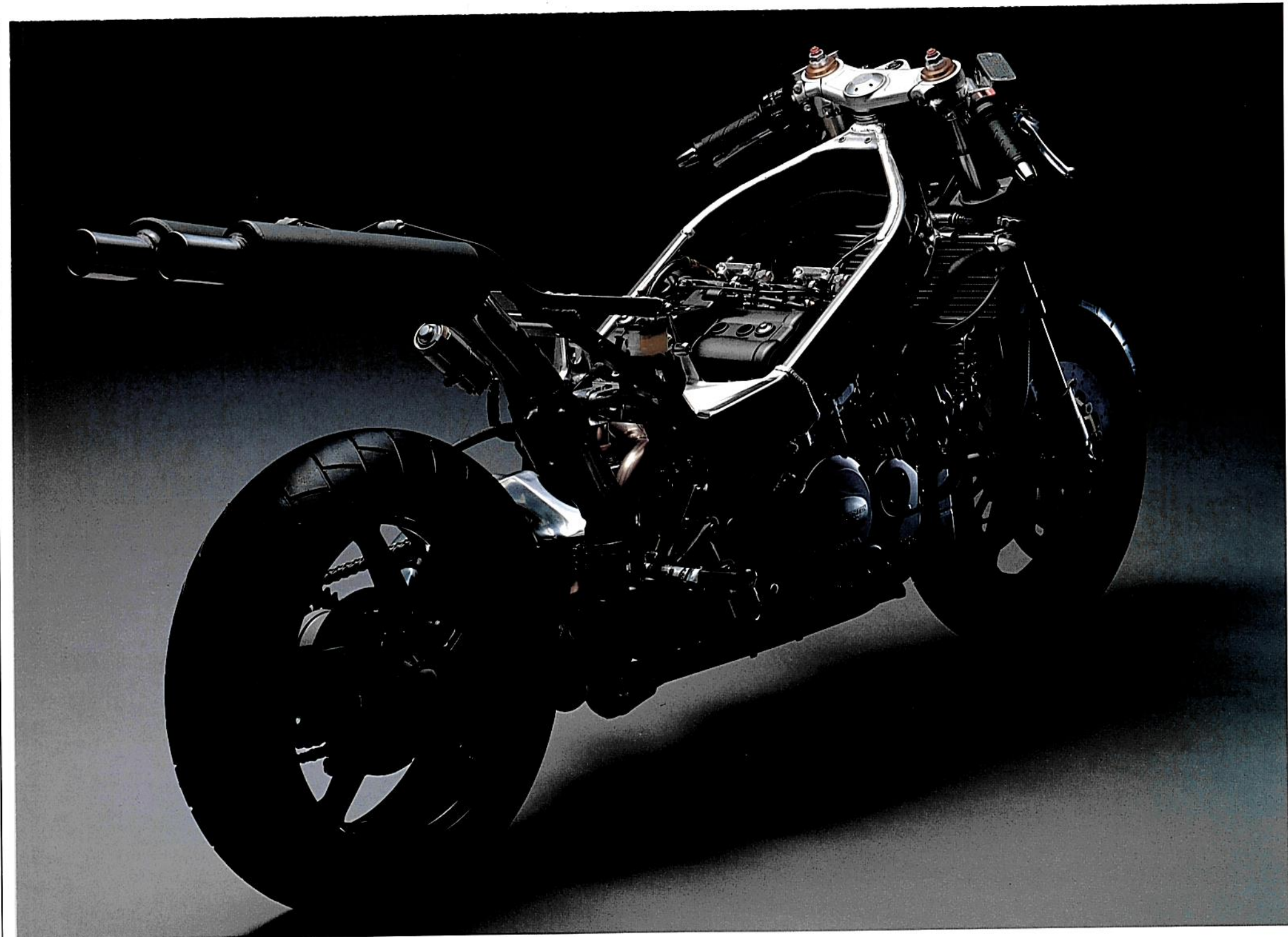


E

ENGINE

A dream of unprecedented technology and performance yields a 4-stroke powerplant unique in the annals of motor history.



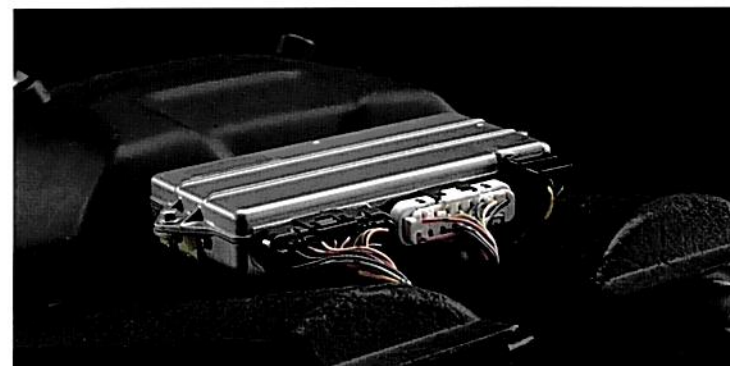




carbon fibre instrument panel. Its five analog meters include a large, centrally located *real-time* tachometer and dials for water temperature, oil temperature and pressure, and fuel level. Wide-throw meters are used for both temperature displays to provide more accurate indication.

"Floating" Speedometer Display

Mounted above the instrument panel is a speedometer display unlike any you've ever seen before. Research into the workings of the human eye led to the development of a new, *floating* LCD display that helps to shorten recognition time by providing an added sense of depth. This was achieved with an internal mirror that reflects up a bright, back-lit digital image from the depths of the meter system. Image bright-



ness is controlled by a knob located at the left of the display, aiding viewing at night and in direct sunlight.

The LCD odometer and trip meter displays are backed-up by a non-volatile electronic memory that safely retains their settings after the ignition key is switched off, and even if the battery is discharged or disconnected.

Magnesium Wheels, Michelin Radial Tyres

Magnesium is well-known for its strength and light weight, properties that make it a perfect material for motorcycle wheels. In line with the NR's emphasis on technological excellence, its elegantly designed five-spoke wheels are cast of magnesium alloy, providing an attractive complement to the other high-quality components used in its construction.

These wheels are shod with wide-tread



Michelin radial tyres that were specially designed for the NR. These tyres measure up to the oval piston engine's phenominal performance with a combination of confident control, sure cornering and braking, and predictable response to the forces of spirited riding.

Immaculate Detailing for a Quality Ride

Every part used in the NR represents a crystallisation of all the elements of technology and craftsmanship that go into creating a vehicle of the finest quality and operation. From the choice of their materials to their very shapes, every part was subjected to rigorous testing before finally being selected for use in the NR.

Although thin, the crepe urethane material used for the seat was selected after



extensive testing to determine its compatibility with a wide range of riding wear, from fabric to leather, in order to provide a comfortable fit for the widest possible range of riders. Handlebar grips and footpegs were also evaluated for the most comfortable positioning and shape, and provide a perfect match for the NR's other superb qualities.

The Key to a New Age

Even a small detail like the NR's ignition key sports an original design. Created in nickel silver and inlaid with carbon fibre resin, this key serves as an elegant symbol of the NR's innovative technology and pride of ownership, while commemorating the arrival of a truly revolutionary riding machine.



S

TYLING

Carbon fibre technology and a comprehensive programme of air management realise a body design of unparalleled beauty and riding comfort.



The NR's stunning red bodywork glows with a look of elegance and exclusivity that sets it apart from any other motorcycle on the road today. Every line and every port shows the results of extensive wind tunnel testing and computer-analysis directed at achieving consistently neutral high-speed handling and optimal internal cooling efficiency. As can be seen in the lustrous depths of its two-tone finish, the fairing utilises state-of-the-art carbon fibre in key locations to provide added strength, while emphasising the NR's image of high-tech quality.

"Zero Lift" Aerodynamic Design

The NR's fairing designers focused their attention on creating a *zero lift* body configuration that provides neutral air pressure characteristics to help maintain a solid

feeling of tyre contact with the road and consistently smooth handling even at autobahn speeds. These *zero lift* characteristics were realised in the design of the NR's low, wide front cowling and sharply slanted, titanium-tinted windscreen, which also

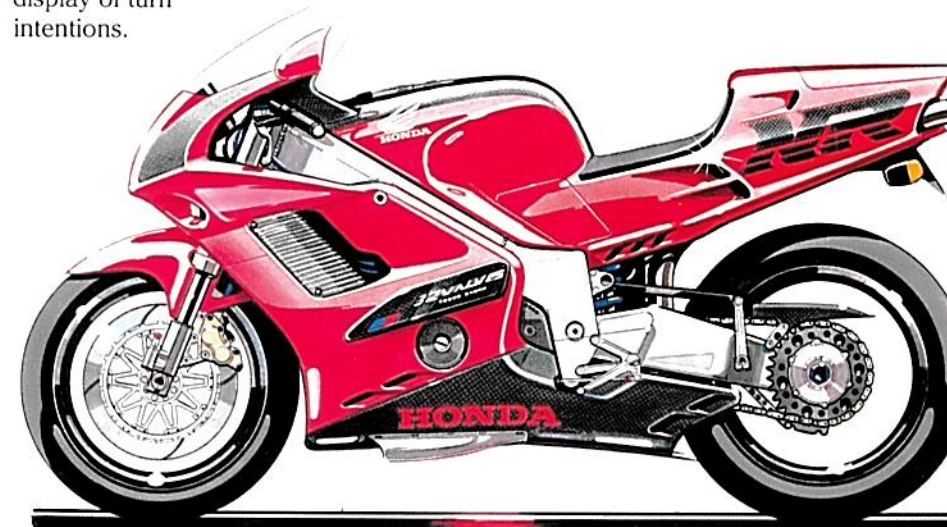


effectively help to reduce air resistance for an extremely low coefficient of drag.

Rider comfort is another gauge of effective aerodynamic design, and the NR's fairing complements the relaxed riding position by reducing the rider's overall exposure to wind pressure and noise. Even the design of the one-piece tank and seat cowl, which elegantly conceals the exhaust system's dual silencers, plays an important part in the NR's total aerodynamics by reducing air turbulence for smoother air flow around both rider and machine.

Projector Unified Headlight

Staring out over the leading edge of the fairing is a dual element projector unified headlight that combines the characteristics of a wide-focus projector-type low beam and a long-focus halogen high beam for brilliant nighttime vision. Front turn indicators are integrated into the wide-vision rearview mirrors for a more prominent display of turn intentions.





The vital spark of the NR's evolution extends back nearly 14 years to 1978, when Honda signalled its return to motorcycle racing. Initially developed as a four-stroke challenge to the two-stroke machines reigning over Grand Prix racing's 500cc class, the NR proved itself as a test bed for many of Honda's emerging technologies.

Beginning with the NR500 0X, which mounted Honda's first oval piston V-4 engine in an advanced monocoque frame, NR racing development saw rapid improvements in performance and handling, as theories were tested and lessons learned. This quest for knowledge later witnessed the improved NR750 competing in the arena of endurance racing, where the oval piston engine's full potential finally began to be seen.

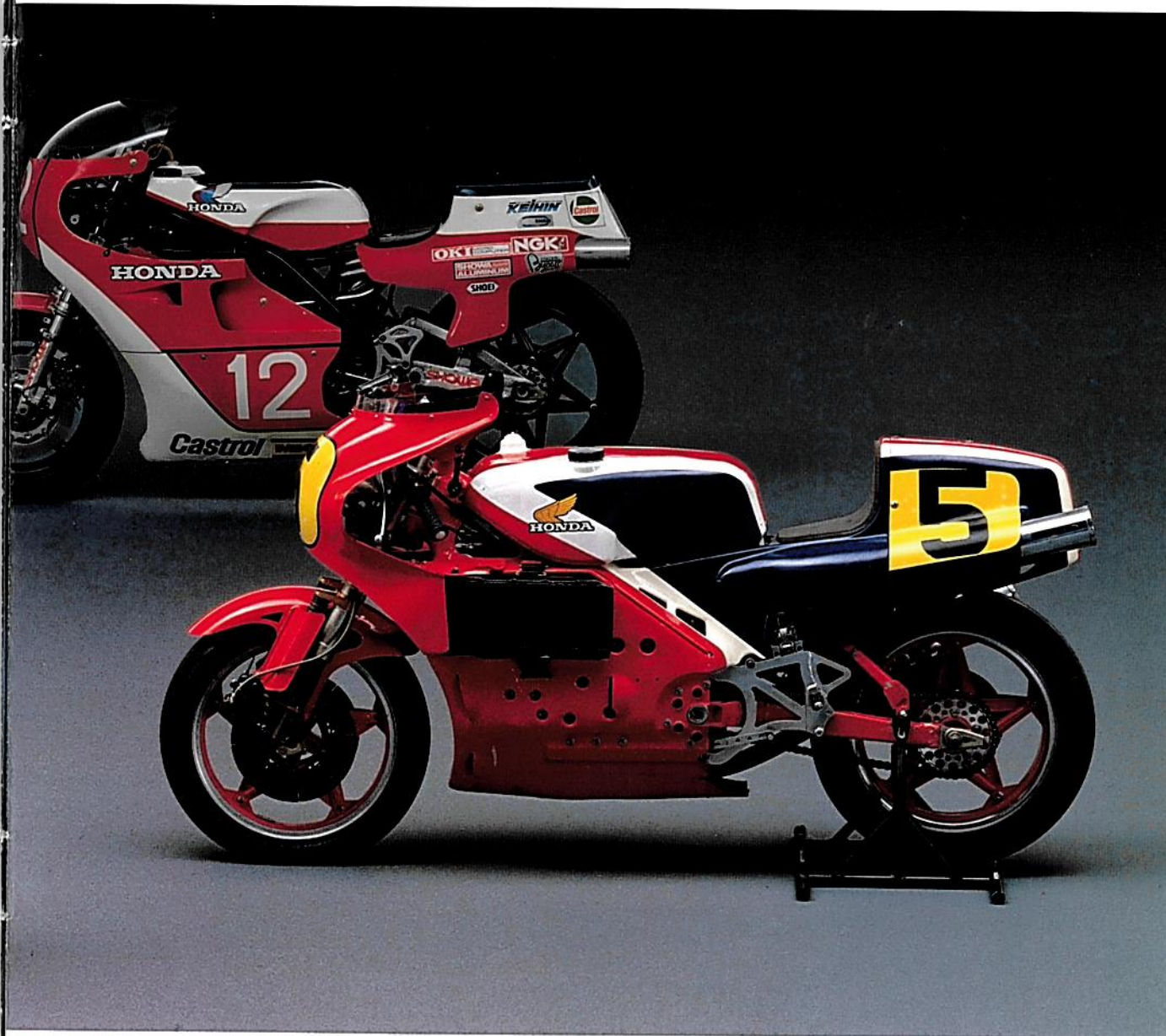


H

ISTORY

**A valiant racing heritage.
The guiding flame for the NR's
technological challenge of the unknown.**



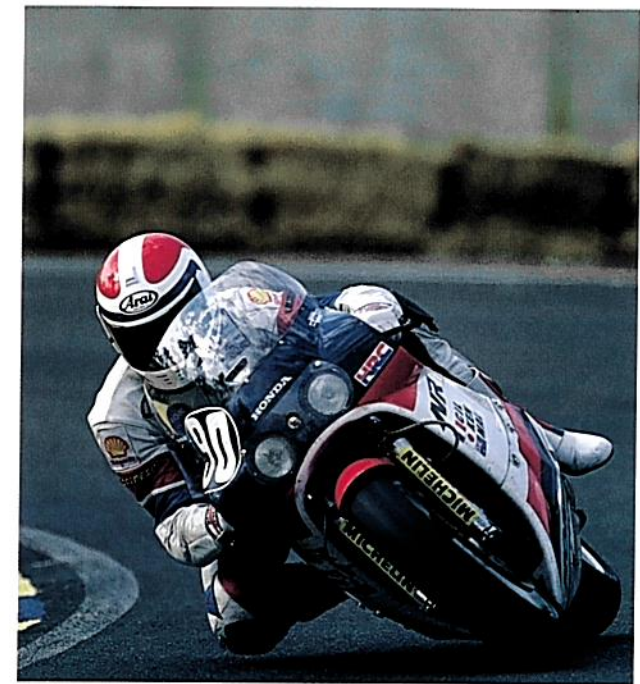


Dedicated to All Who Shared in the Dream

Although the NR saw few actual on-track successes during its years of racing development, its direct involvement in racing's intensely competitive world yielded a wealth of knowledge that simply couldn't be obtained any other way.

Braving modest victories and countless frustrations, the NR's team of riders and engineers charted its exciting new technological horizons, and accumulated valuable experience and understanding along the way that far outweighed any defeats.

Gradually, as new ideas were designed, tested, adapted or discarded, each component and system was refined, perfected, and at last integrated into what is now Honda's premier showcase of motorcycle and manufacturing expertise: the new NR. Without a doubt, a true masterpiece of riding technology and the ultimate realisation of Honda's long-held dream.





HONDA

Specifications NR (ED type)

Engine		Liquid-cooled 4-stroke DOHC 32-valve oval piston dual connecting rod 90° V-4
Bore & Stroke		75.3 × 42mm
Bore Dimensions	(L×W)	101.2 × 50.6mm
Displacement		747.7cm ³
Compression Ratio		11.7 : 1
Carburation		Electronic direct fuel injection
Max. Horsepower		130PS/14,000rpm (DIN)
Max. Torque		7.2kg-m/11,500rpm (DIN)
Ignition		Computer-controlled digital transistorised with electronic advance
Starter		Electric
Transmission		6-speed
Final Drive		O-ring sealed chain
Dimensions	(L×W×H)	2,150 × 700 × 1,090mm
Wheelbase		1,435mm
Seat Height		785mm
Ground Clearance		130mm
Fuel Capacity		17 litres
Wheels	Front	3.50-16 5-spoke magnesium cast
	Rear	5.50-17 5-spoke magnesium cast
Tyres	Front	130/70 ZR R16 (Radial)
	Rear	180/55 ZR R17 (Radial)
Suspension	Front	45mm fully adjustable inverted cartridge-type fork, 120mm axle travel
	Rear	Fully adjustable inverted Pro-Link Pro-Arm with remote reservoir damper, 120mm axle travel
Brakes	Front	310mm dual-disc with 4-piston calipers and semi-metal pads
	Rear	220mm ventilated disc with dual-piston caliper and sintered metal pads
Dry Weight		223kg

Honda machines sold in your area are those most suited to local conditions and regulations. Specifications, appearance, and availability may differ depending on markets, and are subject to change without notice. For details, please consult your nearest Honda dealer.

RIDE WITH STYLE

- Read the owner's manual thoroughly.
- Get to know your machine and its capabilities.
- Concentration assists anticipation.
- Observe other road user's movements.
- Brake in plenty of time.
- Wear quality kit, ride fit, and never after drinking alcohol.
- Good roadcraft and courtesy identifies the skilled and stylish rider.