

## **DUCATI 1098 R**

**The lightest, most powerful twin-cylinder bike ever and true competition-level traction control system supplied as standard for maximum track performance.**

The 1098 R is the ultimate Superbike. The most advanced, most powerful twin-cylinder motorcycle ever built, with the highest torque-to-weight ratio in the sport bike category. It is the product of a team of designers and engineers focussed on one objective only – to win.

The 'R' is a race bike, pure and simple. Its competition specification and superior components together with advanced electronics and race-proven chassis technology deliver a level of performance that empowers you with confidence and capability.

World Superbike rule changes mean that the road-going 'R' version is closer than ever to the factory race bike. The 1098 R is not a replica - it's the real deal. An incredible 180hp L-Twin Testastretta Evoluzione engine in a race-winning Trellis chassis set-up tips the scales at an unbelievably lightweight 165kg (364lbs) and comes with a race kit that introduces Ducati Corse's world championship winning traction control system.

Once again, Ducati raises the bar and sets the world standard for sport bikes while turning the heads and racing the hearts of enthusiasts throughout the world.

1098 Technology: Trademark Ducati features like the high tail section, compact front end, twin under-seat silencers and single-sided swingarm are just some of the features that turned the 1098 models into an instant award-winning success. When launched in November 2006, the 1098 and 1098 S introduced a number of 'firsts' for Ducati and production sport bike design. It was the first production motorcycle to have the amazing stopping power of Brembo Monobloc brakes, the first to have a data acquisition system integrated as standard equipment and the first to use an ingenious construction method for its weight-saving single-sided swingarm. More 'firsts' for a road-going Ducati included the direct application of MotoGP technology, like the power producing GP6-derived elliptical throttle bodies and the use of the information-rich instrumentation originally developed for the World Championship-winning Desmosedici GP7.

The 'R' version of the 1098 is not only the flagship of the Superbike family, but also the platform on which the very latest Ducati Corse technologies are expressed in street bike form. The 1098 R takes all the original 1098 features, reduces weight even further and adds an extra 20 horsepower, traction control, sand-cast crankcases, titanium valves and con-rods, TTX<sup>R</sup> rear suspension and much more to produce the most awesome performance ever seen in this category.

The 1098 R comes with a race kit, which is intended for track use only, boosting power output from 180 to approximately 186hp. The kit consists of a 102dB carbon fibre slip-on muffler kit by Termignoni and a dedicated ECU. The ECU not only has reconfigured mapping to suit the racing mufflers, but also initiates the system dialogue that controls the DTC (Ducati Traction Control) system. The 1098 R is the first ever production bike to be fitted with a true competition-level traction control.

## 1098 R Testastretta Evoluzione power

The 1098 R engine represents the finest twin-cylinder technology in the world. It produces 180hp (132.4kW) @ 9,750rpm and 99.1 lb-ft (13.7kgm) of brute torque @ 7,750rpm in standard mode and an astonishing 186hp when using the supplied race kit, which is intended for track use only.

The specification of this engine underlines its no-compromise race technology. To help contain the massive 'R' power output, the crankcases and cylinder heads have been sand-cast produced, a process that improves the molecular quality of the casting, increasing strength while ensuring that intricate shapes are achieved with absolute accuracy. Confirming the 1098 R's race specification by minimising weight and increasing performance, the crankshaft connecting rods are made in titanium saving 130g over the stock 1098 rods while reducing their reciprocating forces and improving crankshaft acceleration. Cam belt covers moulded in carbon fibre and cam covers cast in magnesium alloy complete the lightweight package. The result is a weight saving of 5.6kg (12.34lbs) over the 999R engine and 2.2kg (4.8lbs) less than the 1098.

The increased capacity of 1198.4cc is the product of a larger bore and stroke of 106 x 67.9mm and is fed through four titanium valves per cylinder and compressed to a ratio of 12.8:1. The valves, which are chrome nitride (CrN) coated, have been increased in diameter by approximately 5% to 44.3mm for the inlet and 36.2mm for the exhaust. They are actuated by rocker arms that are super-finished for reduced friction and fatigue, and double overhead camshafts with radical profiles that achieve approximately 16% more lift than the standard 1098.

These incredible valve performances are only possible because of Ducati's unique Desmodromic system, where valve closure is activated mechanically. At high rpm it would be almost impossible for the valve to follow the steep closure profile of the cam lobe if it were relying upon a normal valve spring, but with the Desmo system the valve is mechanically closed with the same accuracy as it is opened, enabling steep cam profiles and radical cam timings. This system is used on every single Ducati motorcycle including the world-beating Desmosedici MotoGP bike.

The pistons utilise the same design developed for the Desmosedici in the Ducati MotoGP program by using a distinctive double-ribbed undercrown to achieve high strength with minimal piston wall surface area and, therefore, less friction. In this way, the 106mm RR58 alloy components are able to operate reliably at high rpm while delivering incredible performance.

The 1098 R elliptical throttle bodies have been increased 6.5% in size compared to the 1098, a diameter now equal to 63.9mm. For the first time on a road-going Ducati, twin injectors are used on each cylinder. The first centrally mounted injector feeds through a 4-hole nozzle while the second offset injector feeds through a 12-hole nozzle ensuring progressive and fluid power delivery throughout the rev-range. With this configuration the system has the capacity to provide much heavier fueling when used in competition.

The gearbox shares the same ratios as the 1098 and 1098 S, except for 3<sup>rd</sup>, 4<sup>th</sup> and 6<sup>th</sup> gear, which has a higher ratio so as to be able fully exploit the speed gained from the supplied race kit or additional performance modifications. Also with performance in mind and because of its high resistance to fatigue, the gears are machined from the same high-strength steel used in Ducati Corse race applications with 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> gears being subjected to a shot-peening treatment that further ensures their strength and reduced fatigue. The dry, multiplate 'slipper' clutch reduces the destabilising effect of aggressive downshifting and helps provide the fine control required when used under extreme track conditions.

The 2-1-2 exhaust system, which complies with Euro 3 emission standards, is formed in 52mm-57mm diameter tubing with a wall thickness of 0.8mm (.030in) and terminates with Ducati's trademark twin under-seat mufflers beautifully formed in super lightweight titanium and stainless steel.

## **Chassis**

The 1098 R chassis and suspension components are the results of detailed study and a performance first priority approach to development. The goal was to achieve even more weight saving while building in strength and rigidity to manage the incredible power of the new 180hp engine. The result is an impressive 16kg (35lbs) overall vehicle weight reduction compared to the 999R and an impressive 6kg (13lbs) over the already lightweight 1098 S.

### **Trellis frame**

Developed in cooperation with Ducati Corse, the 1098 R Trellis frame features main section tubes in ALS 450 with a diameter of 34mm and 1.5mm thickness to achieve a total weight of just 9kg (19.8lbs) and an extremely high strength-to-weight ratio. Race-proven with hundreds of victories, the Trellis design remains the chosen engineering solution by Ducati Corse and a feature of every Ducati motorcycle.

### **Front subframe**

As with all the models in the Superbike family, the front subframe is produced in magnesium alloy to reduce the weight to just 0.61kg (1.3lbs). While its construction ensures secure, rigid support for the headlamp, instruments and fairing, the weight-saving around this high, forward position contributes considerably to overall 'feel' and control of the machine.

### **Rear subframe**

Underlining its competition intention, the 1098 R is designed as a true 'monoposto' with no provisions to carry a passenger. By producing the rear subframe in aluminium alloy it has enabled a 50% weight reduction (compared to biposto models) to 1.3kg (2.8lbs).

### **Single-sided swingarm**

The 1098's unique single-sided swingarm is made up of main operational components in aluminium castings so as to ensure strength around the pivot points, wheel hub and suspension links, with fabricated aluminium sections used to fuse the construction into a single, beautifully engineered component. For the 'R' model, the swingarm is finished in black to denote its racing status as well as to contrast sharply against the 'racing gold' wheels.

### **Rear Suspension**

Working together with the single-sided swingarm and an efficient linkage is a fully adjustable Öhlins **TTX<sup>R</sup>** single shock. Used for the first time on a Ducati production bike, this exclusive shock gives top performance while enabling considerable weight-saving over similar components produced with traditional technology.

The TTX<sup>R</sup> uses twin tube technology and offers totally separate damping adjustment in compression and rebound. It uses experience gained in MotoGP to minimise friction and reduce the risk of cavitation under extreme conditions. A vitally important feature of the rear suspension system is the ability to adjust rear ride height independent of spring pre-load and other suspension settings, critical when seeking the perfect set-up for personal riding style or track conditions.

## Front Suspension

The front of the new 1098 R boasts fully adjustable 43mm Öhlins with low friction Titanium Nitride sliders feature radial Monobloc caliper mountings. The unique look of these mountings further endorses the no-compromise racing specification of the 1098 R. The Öhlins set-up offers superior road holding, delivers precise feedback, and enables every rider to be more confident and in control. The Öhlins package is completed with a control-enhancing, fully adjustable steering damper.

## Control

### Brembo Monobloc calipers

The 1098 R is also equipped with **Brembo's Monobloc caliper** racing technology. The M4 calipers use four 34mm pistons and two large surface pads for maximum stopping power. The calipers are machined from a single piece of alloy compared to the bolt-together construction of conventional ones. The Monobloc design has much higher rigidity and resistance to distortion during extreme braking and gives a much more precise feel at the brake lever. The **massive 330mm discs** and Monobloc caliper technology combined with the legendary stability of Ducati's Trellis frame and the 1098 R's lightweight 165kg (364lbs) now makes world championship level brake performance available for the road.

### Super lightweight wheels

One of the most effective ways to improve the handling and performance of a motorcycle is to reduce its unsprung weight by using superior lightweight wheels. The 1098 R uses lightweight Marchesini Y-shaped spoke wheels created from forged then machined alloy and finished in 'racing gold'. Both front and rear wheels achieve a lower moment of inertia and unsprung weight to enhance the 1098 R's change of direction and braking performance.

### Fairing and finish

Wind-tunnel development has enabled excellent aerodynamic penetration, allowing the rider to take a perfect racing stance, effortlessly. Great care has been taken in the design of the air supply ducts so to ensure efficient air-flow through radiator and oil coolers as well as provide ample air delivery to the airbox feeding the powerful Testastretta Evoluzione engine. The fairing belly-pan, tank lower side panels, seat assembly and front fender in carbon fibre are contributing factors to the overall performance of the machine.

In true 'R' style, the red bodywork sports white background number plates on the tail section and nose fairing. The front and rear Marchesini wheels are finished in 'racing gold', exactly the same as the F08 official factory race bikes and the fairing belly-pan, front fender and side panels are left in a contrasting natural carbon fibre finish.

Finally, the small red, white and green tricolore graphic, neatly shaped between the twin headlamps in the nose fairing, proudly underlines the Italian design, style and precision race engineering of this motorcycle.

## **Electronics**

### **Instrumentation**

Desmosedici-style digital instrumentation is taken from Ducati's MotoGP World Championship winning GP7 project. This pure racing, minimalist solution has no switches or buttons to compromise its clean lines. Instead, information additional to the default read-out is managed by handlebar-mounted switch gear, allowing the rider to scroll through and select from various menus. The default read-out presents rpm and speed, with the former displayed across the screen in a progressive bar graph. Optionally, the rpm and speed can be displayed in numeric values. The instrument display also doubles as a control panel for the activation of the data acquisition system as well as listing lap times recorded by using the high-beam flash button as a stopwatch. For the 1098 R, fitting of the race kit initiates dialogue between the race kit ECU and the display to activate the DTC (Ducati Traction Control).

### **Traction control**

For the first time ever on a production motorcycle, a true competition-level traction control system comes integrated into the 1098 R electronics as standard equipment. Activated by fitting the race kit ECU, which is designed to be used with the race mufflers and so intended for track use only, the Ducati Traction Control (DTC) system is accessible via the digital instrument display and offers eight levels of control.

The DTC is the same system developed and used by Ducati Corse for their world championship winning MotoGP and World Superbike projects and offers a choice of eight profiles developed by professional racers. Each profile has been programmed with a wheel-spin tolerance matched to progressive riding levels of skill and confidence from one to eight. Underlining the fact that this is a professional system intended strictly for track use only by competent riders, profile eight has been developed by the official Ducati MotoGP test rider, Vittoriano Guareschi.

Choose the profile that best suits the track conditions and riding style and, upon activation, front and rear wheel sensors compare speed differential to sense when rear traction is being broken (wheel-spin). Using exactly the same software logic developed and used by Ducati Corse, instant electronic adjustment to the ignition advance or a pattern of 'spark cuts' initiates immediate control over power output so as to restore traction at the rear wheel before re-establishing normal power delivery. In this way, DTC provides an incredible advantage during mid-corner acceleration.

Once again Ducati raises the bar for the sport bike category by transferring its MotoGP race technology into production.

## **Data acquisition**

Supplied with the 1098 R, the Ducati Data Analyser (DDA), which includes PC software, a USB-ready data retrieval card and instructions, enables owners to review and analyse the performance of the bike and its rider, and make comparisons between various channels of information.

Normally used on race bikes only, the system records numerous channels of data including throttle opening, vehicle speed, engine rpm, engine temperature, distance travelled, laps and lap times. The system also automatically calculates engine rpm and vehicle speed data so as to also display gear selection as an additional channel of information. At the end of a ride or track session, up to 2mb (approximately 3.5 hours) of data can be downloaded to a PC ready to compare, analyse and get an inside view of the performance of both the rider and the 1098 R.

Data can be analysed in graphic form with options to zoom into detail of specific sections. Dragging a trace along a timeline to reveal individual values of the above listed channels enables the user to analyse performance in the same way that data technicians are able in factory teams.

## **COLOUR SCHEMES**

	<b>Fairing</b>	<b>Frame</b>	<b>Wheels</b>
<b>1098 R</b>	Red	Red	Racing Gold