



2013 DUCATI SUPERBIKE

The 2013 Ducati Superbike family line-up is now completed with the highly-anticipated arrival of the 1199 Panigale R, the absolute flagship of the range and the machine specially developed with enhanced technical specification by Ducati Corse for World Superbike homologation. The exciting "R" model stands alongside the 1199 Panigale and 1199 Panigale S in the new-for-2013 arctic white colour scheme and signature Ducati red, in addition to the exclusive 1199 Panigale S Tricolore. All 2013 1199 models are updated with latest generation engine management mapping and Ride-by-Wire calibration, further enhancing the Ducati Superbike riding experience.

The highly successful 848^{EVO} is available in the traditional colours of Ducati red* with red frame and black wheels, dark stealth* with racing black frame and black wheels and arctic white* with red frame and red wheels, while the exclusive 848^{EVO} Corse Special Edition, with a new, lightweight, aluminium fuel tank, gets dressed in the stunning new Ducati Corse Test Team livery of matte black and matte grey.

*Country specific



NEW FOR 2013

Superbike new features overview

848^{EVO} Corse Special Edition

- Ducati Corse Test Team livery
- Aluminium fuel tank

1199 Panigale

- Arctic white colour scheme
- Enhanced engine mapping and R-b-W calibration

1199 Panigale S

- Arctic white colour scheme
- Enhanced engine mapping and R-b-W calibration

1199 Panigale R

- As "S" version with:
 - Ducati red with white racing features colour scheme
 - Lightweight titanium con-rods
 - Lightweight flywheel
 - DLC-coated rocker-arms
 - Increased rev-limit (12,000rpm)
 - 4-point adjustable swingarm pivot
 - Carbon fibre:
 - Single-sided swingarm protector
 - Clutch cover protector
 - Rear hugger
 - Rear suspension guard
 - Footrest heel guards
 - Ignition switch surround
 - Top fairing inner panels
 - Race kit:
 - Full Termignoni exhaust system
 - Up-map key with dedicated ECU mapping
 - High-penetration racing screen
 - Fairing mirror-caps



NEW FOR 2013

DUCATI 1199 PANIGALE R

The pursuit of perfection

The "R" version of Ducati's Superbikes has always been the dream model, the machine taken by Ducati Corse and enhanced with high performance preparation for homologation into the highly competitive environment of World Superbike.

The 1199 Panigale R model introduces the very latest version of engine and R-b-W mapping to all the 1199 models, improving performance and refining the overall Superbike riding experience. The "R" takes everything that the "S" model is currently equipped with and applies a list of enhancements to the technical specification that enable the model to achieve even greater targets. Titanium con-rods, which save an overall 0.63kg (1.38lb), a 0.7kg (1.54lb) lighter crankshaft flywheel, DLC-coated rocker-arms and revised engine mapping now enhance the Superquadro engine's crank acceleration and allow it to rev 500rpm higher to a 12,000rpm limit, an incredible engineering achievement for 112mm pistons.

The famous "R" race kit components consist of high-penetration racing screen, fairing mirror caps in machined alloy and a full Termignoni exhaust system with dedicated ECU mapping (for track use only). The system provides an impressive power increase of 3% at the top of the rev-range and 15% in the mid-range, further amplified by the R's acceleration-enhancing 15-41 final drive ratio.

The race-oriented "R" model also features a 4-point adjustable swingarm pivot, designed to enable riders a personalised and precise set-up of varying levels of pro or anti-squat to optimise traction on corner exit. The settings are dialled-in using two user-friendly eccentric adjusters that offer pivot positions at +2mm higher, -2mm lower and -4mm lower than the standard position, each positively and accurately locked and located. The clearly marked, easy-to-use system provides optimum adjustability for competition use.

Additional enhancements to the machine include lightweight carbon fibre rear hugger, rear suspension guard, heels guards, ignition switch surround and top fairing inner panels and carbon fibre protectors for the single-sided swingarm and clutch cover. These lightweight chassis and engine components enable the "R" version a dry weight of just 165kg (363.7lb), even with an ABS braking system fitted as standard equipment. This top-of-the-range model is also fitted with a special race-style seat fabric for added "feel" and equipped with the GPS-enhanced Ducati Data Acquisition system, for automatic lap times and circuit map-linked data.

The 1199 Panigale R is dressed in Ducati red with defining white race features, sporting a mix of red and brushed aluminium on the fuel tank with lightweight forged wheels by Marchesini in black.



NEW FOR 2013

SUPERBIKE 848^{EVO} CORSE SPECIAL EDITION

Racing instinct

Dressed in the new official Ducati Corse Test Team livery of matte black and matte grey, the 848^{EVO} Corse Special Edition takes the already exciting 848^{EVO} and adds racing instinct with outright style and enhanced performance.

The brand new, lightweight aluminium fuel tank is beautifully formed in 2mm thick aluminium, brush finished and matte clear-coated with matte black and grey racing stripes that accentuate its Ducati Corse "feel". The tank reduces the model's overall dry weight by 1kg (2.2lb) to 167kg (368lb) and increases the model's fuel capacity by 2.5 litres (0.66 US gal) to 18 litres (4.75 US gal).

Equipped with full 8-level Ducati Traction Control (DTC) and the Ducati Quick Shift (DQS) system, the Corse Special Edition raises its game even further on the road or race track. Combine the enhanced electronic package with the superior feel of fully adjustable Öhlins rear suspension and 330mm front brake discs and it is clear that the brand new model fully deserves its "Special Edition" status.

The 848^{EVO} Corse Special Edition uses identical DTC and DQS concepts as the 1199 Panigale. DTC monitors front and rear wheel speeds to detect rear wheel-spin under acceleration and electronically reduces engine power to optimise traction performance. DQS allows the throttle to remain open when changing-up through the gearbox, helping to save vital fractions of a second in the pursuit of faster lap-times.

The 848^{EVO} Corse Special Edition's new livery is set against red Trellis frame and black wheels.



SUPERBIKE 848^{EVO}

Ducati 848^{EVO} - Excitement^{EVO}

The 848^{EVO} is Ducati's most impressive mid-range Superbike ever, and provides an exciting way to enter the world of Ducati Superbikes. 2013 sees the 848^{EVO} Corse Special Edition equipped with a new aluminium fuel tank and Ducati Test Team colour scheme to go with the existing Ducati Traction Control, Ducati Quick Shift, Öhlins rear suspension and 330mm brake discs specification.

The "EVO" treatment applied to the 848 enabled 140hp (103kW) and a torque of 72.3lb-ft (98Nm) for razor-sharp and easy-to-use power delivery, while the combination of the 848's legendary 167kg* (368lb) dry weight chassis set-up and planet-stopping Brembo Monobloc brakes provides unthinkable braking performances most can only dream of.

Iconic features from World Championship-winning machines, are all part of the 848's DNA and, in constant pursuit of perfection, Ducati engineers enhanced specification to deliver impressive performance, whether racing through track-day competition or just riding through mid-town traffic.

*Corse Special Edition



The 848^{EVO} Testastretta Evoluzione engine

The 848^{EVO} is powered by a liquid cooled, L-Twin, Desmodromic engine producing 140hp (103kW) @ 10,500rpm and a high-accelerating 72.3lb-ft (10kgm) of torque @ 9,750rpm.

The 94mm x 61.2mm bore and stroke breathes through 4 valves per cylinder fed by revised inlet port shapes and racing-style elliptical throttle bodies, which have an equivalent diameter of 60mm. The EVO's piston crown and combustion chamber shape improves burn efficiency, while the 13.2:1 compression ratio and performance-driven camshafts provide 13mm of valve-lift and 257° of inlet duration.

Electronically injected and ignited by Marelli, the super-efficient power unit then exhausts through a lightweight 2-1-2 system equipped with a catalytic converter and to twin lambda probes for smooth mapping and Euro3 conformity. Terminating in twin under-seat silencers, the system delivers that unmistakable signature sound of the Desmo 90° L-Twin.

The highly advanced 848 engine was the first Ducati Superbike to introduce vacuum die-cast crankcases, formed using Vacural® technology, a process that achieves a significant weight saving and ensures consistent wall thickness and increased strength.

848^{EVO} Chassis

The 848^{EVO} chassis and suspension are the result of a 'performance-first' priority approach to development, in which the goals are always to achieve lightweight with high strength and rigidity to manage the high-powered Testastretta Evoluzione engines. Developed in cooperation with Ducati Corse, the lightweight Trellis frame features 34mm main section tubes with a material thickness of 1.5mm.

Producing a front sub-frame in magnesium underlines the attention to weight-saving detail. Its construction provides secure support for the headlamp, instruments and fairing, and the weight-saving around this high, forward position contributes considerably to overall 'feel' and control of the machine.

The dual construction technique used for the single-sided swingarm allows the main operational components to use individual aluminium castings so as to ensure strength around the pivot points, wheel hub and suspension links, while lightweight, fabricated aluminium sections are used to complete the construction into a single, beautifully engineered component. The 848^{EVO} swingarm is then presented in a sophisticated black-anodised finish.

The lightweight front wheels used on all Ducati Superbike models substantially reduces the moment of inertia, enabling a faster change of direction and enhanced acceleration and braking performances. The 848^{EVO} is equipped with Y-shaped, 5-spoke wheels finished in black and mounted with Pirelli Diablo Supercorsa SP 120/70 ZR17 front and 180/55 ZR17 rear tyres.

The 848^{EVO} features fully adjustable 43mm Showa forks with radial brake calliper mountings, which provide superior road holding and precise feedback. A control-enhancing steering damper maintains perfect front-end stability, inspiring supreme control and confidence alongside the increased power output.



The lightweight Trellis frame and single-sided swingarm enable a compact and weight-saving rear suspension linkage system, which features separate lower pick-up points for the push-rod and fully adjustable Showa single shock suspension unit. This 'tandem' design effectively reduces stress around the linkage pick-up area of the Trellis frame. The 848^{EVO} Corse Special Edition raises the specification even higher with a fully adjustable Öhlins rear shock offering enhanced feel for performance-hungry sport riders.

848^{EVO} Monobloc brakes

Ducati Superbikes have always been famous for their incredible, track-derived braking performance and the 848^{EVO} is no exception. Featuring Brembo's powerful Monobloc calliper racing technology applied to 320mm discs, the EVO's incredible braking capability is a result of Ducati's continual quest for responsible performance.

Machined from a single piece of alloy, the callipers achieve a higher rigidity and resistance to distortion during extreme braking. The resulting increase in hydraulic efficiency not only delivers incredible braking power, but also provides an enhanced and precise 'feel' at the brake lever. The twin Monobloc callipers each have four 34mm pistons that grip 320mm discs to help generate planet-stopping braking.

The 848^{EVO} Corse Special Edition takes that Monobloc braking experience to the next level with full Superbike-style 330mm front discs.

848^{EVO} Aerodynamic bodywork

Carefully designed for aerodynamic efficiency and to hug the sleek lines of the chassis, the Superbike bodywork enables the rider to blend effortlessly into the correct riding position.

Its race-developed fairing design ensures perfect integration with the cooling system by providing efficient flow through the advanced, large surface area coolant radiator, which is assisted by lightweight, high flow electric fan assemblies and oil coolers. Aerodynamically shaped air ducts positioned just below the headlamps are precisely calculated to provide ample air delivery to the pressurised airbox.

The lightweight bodywork contributes considerably to overall performance by reducing weight, protecting the Testastretta Evoluzione engine's power output, and assisting the rider to effortlessly 'tuck in' from the wind stream and reduce drag to achieve maximum straight-line track speeds.



848^{EVO} Instrumentation

This pure racing digital instrumentation originating from Ducati's GP project has no switches or buttons to compromise its clean, minimalist lines. Instead, information additional to the default read-outs is managed from the left-hand handlebar-mounted switch gear, allowing the rider to scroll through and select from various menus.

The display, which has a bright white LED back lighting 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. Additionally, it displays lap times, DTC level selected (if activated on the Corse Special Edition) time, air temperature, coolant temperature, battery voltage, two trips and a trip that automatically starts as the fuel system goes onto reserve. Warning lights illuminate to signify neutral, turn signals, high-beam, rev-limit, low oil pressure, fuel reserve, DTC intervention selected (if activated on the Corse Special Edition) and scheduled maintenance. The instrument display is also used as the control panels for the DDA (available as an accessory by Ducati Performance), DTC and DQS systems (Corse Special Edition version) as well as listing lap times recorded by using the high-beam flash button as a stopwatch.

848^{EVO} lights and indicators

The horizontal twin headlamps are modernised interpretations of the iconic 916, restyled and updated with the latest lighting technology. Two polyellipsoidal units light the way with a powerful beam while maintaining an aggressive look to the front of the machine in pure Ducati Superbike tradition. The rear light employs a specially designed strip of LEDs enhanced by a high diffusion lens shaped into the sleek lines of the tailpiece. The same LEDs are intensified for brake lights.

The directional indicators also use the latest in LED technology for illumination. The frontal indicators are beautifully integrated into the rear view mirrors, which come with an optional spacer kit enabling an extension of 30mm over the standard mirror stem length.



SUPERBIKE 1199 PANIGALE

The award-winning 1199 Panigale

The award-winning 1199 Panigale enters 2013 in standard configuration with the sensational new arctic white colour scheme added to the original Ducati red. The model offers optional ABS and is equipped with Marzocchi's 50mm lightweight aluminium front forks, Sachs rear suspension and steering damper and with DTC, DQS, EBC and RbW combined into the Ducati Riding Modes.

The 1199 Panigale S also adopts the new arctic white colour scheme in addition to the original Ducati red, is also available with optional ABS and comes equipped with Öhlins electronic 43mm front forks with adjustable Öhlins steering damper and an Öhlins electronic TTX suspension unit on the rear. In addition, the "S" model rolls on super lightweight forged and machined Marchesini wheels, has a carbon fibre front mudguard and full LED lighting. The "S" model is supplied with an "Aero kit", which consists of two lateral attachments for the top section of the fairing, designed to further enhance the machine's aerodynamic penetration and reduce its drag coefficient. The 1199 Panigale S adds DES to the full electronics fire-power of ABS (optional) DTC, DQS, EBC and RbW to provide the Ducati Riding Modes.

The special 1199 Panigale S Tricolore version celebrates the new generation Superbike, is fitted with ABS as standard and sports the proud Italian colours of red, white and green. The distinctive model carries the same equipment as the "S" version with the addition of the new generation DDA+ with special GPS lap time function as well as a titanium racing muffler kit* by Ducati Performance.

The final introduction to the Superbike family for 2013 is the highly anticipated 1199 Panigale R, the full performance version developed for homologation into the World Superbike Championship. Dressed in Ducati red with white racing features, the flagship model carries many enhancements, including titanium con-rods, lightweight flywheel, a higher rev-limit, adjustable swingarm pivot, carbon fibre components and a performance kit consisting of re-shaped screen and fairing mirror-caps and a full Termignoni racing exhaust with dedicated ECU mapping (not for road use). The "R" also introduces latest generation engine management mapping and ride-by-wire calibration to the entire 1199 Panigale range.

*Country specific



The most extreme benchmark

Ducati's latest generation Superbike, the 1199 Panigale, goes beyond the barriers of motorcycle design and engineering to set the most extreme benchmark ever and the direction for future sport bikes. Developed in the red-hot environment of racing and designed to raise the performance bar to its highest, the 1199 Panigale uses innovative Ducati Corse-derived solutions to make World Championship level technology available to everyone.

The most high tech, most powerful twin-cylinder production engine on the planet is now an integral part of an innovative monocoque chassis that combine to deliver an astonishing 195hp from 164kg* (361.5lb) of futuristic Italian thoroughbred. The highest production motorcycle power-to-weight and torque-to-weight ratios in the world are fitting trophies for the incredible results that Ducati have achieved.

With the click of a button, Ducati's Riding Mode concept delivers performance with enhanced rider confidence by combining seven class-leading technologies. The latest-generation sports ABS system, Ducati Traction Control (DTC), Ducati Electronic Suspension (DES), Ducati Quick-Shift (DQS), Ducati's race-derived Engine Brake Control (EBC) and Ride-by-Wire (RbW) are now all programmed into seamless, electronic rider assistance. Even the full colour Thin Film Transistor (TFT) display changes to suit the rider's environment.

State-of-the-art from the ground-up and melding latest technologies with the latest family features, the 1199 Panigale is totally "Ducati" in every respect. Its no-compromise approach to sport design and stylish attention to incredibly fine detail presents authentic Italian performance at its purist.

Racing is the platform on which Ducati has always challenged and measured itself. It is a discipline for designers and engineers and the bedrock of motivation for a company in which the constant desire for victory has become a way of life. With over 300 World Superbike race wins, more World Championship titles than all other manufacturers together and the passionate driver of innovation in MotoGP, Ducati's focus on sportbikes is stronger than ever.

Ducati have combined the innovative "monocoque" frame solution with the extraordinary "Superquadro" L-twin engine design and race-derived electronics to produce the champion of all Superbikes. Bred for the track and trained for the road, the 1199 Panigale is a true revolution of the species destined to influence the entire sportbike environment.

*Dry weight



Revolution of the species

Every generation of Superbike produced at Ducati represents an accurate and historic snap-shot of technology and engineering solutions at that time. Some features like the Trellis frame and under-seat exhaust will remain as legendary milestones in Superbike history, innovative benchmarks qualified by endless imitation.

In the predatory world of racing, however, where complacency risks extinction, a constant Darwinian-like adaption to the environment would not have been enough for survival. Instead, Ducati invested its time in a “revolution” of the species, not an evolution. An innovative and ingenious breakthrough design where multiple vital components have morphed into one to create the monocoque skeleton of the 1199 Panigale.

Designers and engineers of the latest generation Superbike were given a “blank canvas” to reach the apparently impossible 1199 Panigale targets of 10kg less weight and 25hp more power. Every detail, every dimension and every design decision has been driven entirely by a zero-compromise brief to create the highest performance Ducati Superbike of all time. The 1199 Panigale sets the most extreme benchmark ever and its arrival represented one of the most historic moments in Ducati’s incredible Superbike history.

Pronounced “*Pan-ee-gah-lee*”, the model breaks with Ducati’s Superbike tradition by adding a name to its 1199 engine designation, making a significant association to its historic roots in the Borgo Panigale area of Bologna. In an Italian territory known as “Motor Valley” and where high performance and racing runs through the veins of its passionate people, Ducati have underlined their pride in being world ambassadors for the “Made in Italy” title by immortalizing their birthplace in the name of the new Superbike.



Unmistakably Ducati

Every last detail of the 1199 Panigale pays tribute to the rich heritage of racing on which Ducati is built. Components that are not only functionally efficient, but also minimalist, essential and beautifully engineered into pieces of automotive art.

Climb aboard the 1199 Panigale and take hold of the bars and the feeling of pure racing is everywhere. The finely formed top-clamp with weight-saving hollows and recesses immediately communicates Italian engineering at its very best.

Radial brake and clutch pumps, Ducati's precise switchgear and full Ride-by-Wire twistgrip give a race-driven sense of minimalism further enhanced with the monocoque-integral steering head flowing into the magnesium front sub-frame and Ducati Corse-style instrumentation. Compared with the previous generation Superbikes, revised rider ergonomics are immediately noticeable from the cockpit with seat-to-handlebar dimension 30mm (1.18in) shorter and bar height 10mm (0.39in) higher and 32mm (1.26in) wider. Even the lightweight, 17 litre (4.5 gal US) aluminium fuel tank is sculpted perfectly to the rider.

The horizontal twin headlamps are also more integrated with the frontal intake ducts and create a true "race face" for the new Superbike. While the 1199 Panigale illuminates with LED positioning and conventional main light, the 1199 Panigale S and Tricolore boast motorcycling's first ever full LED positioning and main light solutions.

Twin rear lights are moulded perfectly around the recessed seat air ducts and illuminate with an attractive light-guide surround effect, enhanced with LED brake lights. Front LED indicators are integrated into the mirror bodies and rear indicators, which are also LED*, are styled with clear lenses.

The majority of the frontal air ducts feed the main airbox, while a small splitter also diverts air into the fairing bodywork to ensure efficient cooling for the onboard electronics. The carefully executed shape at the rear of the fairing enables a highly efficient exit from the radiator area, protecting the Superquadro's power output and further reducing aerodynamic resistance.

The sleek shape of the seat and tail-piece is accentuated by the under-engine location of the exhaust system, further enhancing the aggressive stance of a true Ducati Superbike.

*Country specific



Monocoque technology

The 1199 Panigale's chassis represents Ducati's innovative and courageous step forward in motorcycle design, merging multiple parts into one compact and lightweight component, while re-evaluating rider posture with a revised ergonomic triangle. Developed in the super-competitive racing environment, the extremely compact monocoque construction integrates the airbox to become one of the key elements in reducing the Superbike's overall dry weight by an incredible 10kg (22lb) to a benchmark 164kg (361.5lb).

Using the Superquadro engine as a stressed member of the chassis, the short and strong aluminium monocoque is made in die-cast aluminium and is responsible for 5kg (11lb) of the overall weight saving of the design. The monocoque attaches to the cylinder heads of the specially designed engine, protruding forward to house the steering head bearings and forming the airbox along the way, which is capped-off and sealed when the 2.9kg (6.3lb) lighter aluminium fuel tank is attached, again using one component to fulfil the roles of two.

While the cylinders remain true to Ducati's signature 90° L-twin configuration, the engine has rotated the top-end backwards around the crankshaft a further 6° compared to the 1198, to give more clearance on the front wheel and enable engineers to modify the front and rear weight bias. This also enables a front-end geometry of 24.5° of rake and 100mm (3.94in) of trail. Attaching directly to the rear of the engine, the new fully die-cast aluminium, single-sided swingarm is 39mm longer than the 1198, contributing to the increased wheelbase of 1,437mm (56.6in) and setting the weight distribution of the 1199 Panigale at 52% front and 48% rear with average-size rider onboard.

With the exhaust system located below the engine, the die-cast aluminium rear sub-frame is considerably lighter and also attaches directly to the Superquadro engine, while the super lightweight, magnesium front sub-frame attaches directly to the monocoque frame, providing secure support for the headlamp, instrumentation and fairing. This combination of weight saving and centralisation of mass around these high front and rear sub-frame areas substantially contributes to overall vehicle agility.



Innovative suspension

Incorporating Ducati's Riding Mode technology, the 1199 Panigale S and Tricolore are fully equipped with front and rear Ducati Electronic Suspension (DES) system by Öhlins. The 43mm Öhlins NIX30 forks are adjustable electronically in compression and rebound damping, while spring pre-load is manual. An adjustable steering damper completes the full Öhlins package.

The Öhlins TTX36 rear unit features twin tube technology to offer totally separate damping adjustment in compression and rebound and minimise the risk of cavitation under extreme conditions. The unit is fully adjustable electronically in compression and rebound damping, while spring pre-load is manual.

The electronic suspension adjustment can be made either by using the pre-set Riding Modes, which have been developed by Ducati test riders and racers, or in independent mode, which allows riders to use their own personal and saveable settings. Digital damping adjustments send signals that execute the mechanical adjustment via electronic actuators mounted in the suspension units.

The 1199 Panigale uses incredibly lightweight, 50mm pressurised Marzocchi USD forks that feature hard-anodised aluminium sliders. Proven by Marzocchi in the most severe off-road environments, the aluminium fork assembly uses a pressurised damping system that also enables a reduction in oil capacity and, therefore, also weight. They represent a cutting-edge solution for the 1199 Panigale, saving a further 1kg (2.2lb) on a project which demanded innovation to achieve the extreme weight-saving targets set by designers.

Fully adjustable in spring pre-load and compression and rebound damping, the matte champagne coloured fork bodies house low-friction, hard-anodised black aluminium sliders and forged aluminium fork bottoms with beautifully formed radial calliper mountings. A fully adjustable Sachs rear suspension unit completes the package.

On all versions of the 1199 Panigale, the fork leg centres are set to World Superbike-style widths, enabling uncompromised air-flow to the brake discs for optimum cooling.

The rear suspension of the 1199 Panigale features a stylish and practical side-mounting, enabling increased space for the rear cylinder head, which has been rotated backwards around the new generation engine. The unique positioning renders the unit totally accessible for spring pre-load and rider-height adjustment, and is designed to provide a fast and easy linkage adjustment by simply changing the pushrod fixing-point from "progressive rate" for road use with a passenger to "flat rate" for track use.

The race-oriented "R" model also features a 4-point adjustable swingarm pivot, designed to enable riders a personalised and precise set-up of varying levels of pro or anti-squat to optimise traction on corner exit. The settings are dialled-in using two user-friendly eccentric adjusters that offer pivot positions at +2mm higher, -2mm lower and -4mm lower than the standard position, each positively and accurately locked and located. The clearly marked, easy-to-use system provides optimum adjustability for competition use.



Latest generation brakes

For its latest generation of Superbike, Ducati ensured the selection of the latest generation of Brembo Monobloc M50 callipers, presenting a super-compact design that reduces their total unsprung weight by a further 0.5kg.

Machined from a single piece of alloy, the callipers achieve a higher rigidity and resistance to distortion during extreme braking. The resulting increase in hydraulic efficiency not only delivers incredible braking power, but also provides an enhanced and precise "feel" at the brake lever. The twin Monobloc M50 callipers each have four 30mm pistons that grip 330mm discs to achieve spectacular braking performance.

Sport-oriented ABS

The 1199 Panigale uses the very latest in sport-oriented ABS technology to enable full integration with Ducati's three pre-programmed Riding Modes. Operating with the latest generation 9ME Bosch processor, the system enables full ABS on the front only, when in Race mode, allowing the rider initial braking drift on the rear during race track corner entry. The system then activates full front and rear ABS, front-to-rear combined braking (CBS) and "rear lift-up" detection when in Sport and Wet Riding Modes.

Remaining almost undetectable at the lever, these advanced features enable shorter braking distances by optimising brake force distribution for superior vehicle stability. The advanced ABS, which is optional on the 1199 Panigale and 1199 Panigale S and standard equipment on the 1199 Panigale S Tricolore, can also be deactivated via the instrumentation control panel.

Panigale wheels and tyres

While the 1199 Panigale rolls on lightweight 10-spoke wheels in 3.5in front rim width and 6.00in rear, enabling a fast change of direction and enhanced acceleration and braking performances, the 1199 Panigale S and 1199 Panigale S Tricolore are equipped with super lightweight, triple 3-spoke, forged and machined wheels by Marchesini, finished in black with signature red pin-stripping.

All 1199 Panigale versions roll on Pirelli Diablo Supercorsa SP tyres, road-going race replicas of the official World Superstock 1000 tyres. While the front uses a 120/70 ZR17, the 200/55 x ZR17 represents the widest rear tyre ever fitted to a production Ducati Superbike.

Designed for precise line-holding and corner trajectory, the rear 200/55 x ZR17 effectively increases the contact patch area and speed of lean by combining the 200mm width with a higher profile. Pirelli and Ducati engineers worked together to create this ideal "match" between front and rear profiles and the results generate incredible "feel" and directional agility from the new monocoque chassis technology during corner-entry.

The structures and compounds are derived directly from Pirelli's experience in World Superbike competition. They present a complex carcass designed for stiffness under heavy braking and shoulder areas that maximise contact patch, further enhanced with a bi-compound tread laced with new polymers to generate rapid warm-up and constant grip.



Electronic technology

The 1199 Panigale is equipped with many of the latest innovative electronics developed by Ducati on the race track, and they are combined, managed and displayed on full TFT technology instrumentation. First introduced to the motorcycle industry on the Ducati Diavel, the TFT display is super-enhanced on the 1199 Panigale.

The state-of-the-art electronics package features an enhanced version of the Ducati Data Analyser (DDA+), and Ducati Riding Modes, with fully integrated ABS, Ducati Electronic Suspension (DES), Ducati Traction Control (DTC), Ducati Quick Shift (DQS), Engine Brake Control (EBC), full Ride-by-Wire (RbW) and the Thin Film Transistor instrumentation (TFT).

The 1199 Panigale uses a compact version of its Ducati Quick Shift (DQS), first introduced on the 1198 SP and increases its formidable fire power with a sport-intended, adjustable ABS system and Ducati's Engine Brake Control system (EBC), designed to enhance stability during de-acceleration.



Ducati Riding Modes

Introduced on the award-winning Multistrada in 2010, Ducati's industry-changing Riding Modes effectively offer the perfect set-up appropriate to rider and environment by selecting from a choice of three pre-set modes. Each Riding Mode is pre-programmed to instantly change engine character and suspension set-up in addition to ABS, DTC and EBC levels - even while riding. The modes are made possible by combining a number of class-leading technologies.

An electronic Ride-by-Wire (RbW) system – with enhanced calibration for 2013 - administers different mappings to regulate power delivery, while on the "S" version Ducati Electronic Suspension (DES), by Öhlins, instantly configures the suspension set-up with electronic adjustment. The Ducati Traction Control system (DTC) uses eight levels of system interaction to enhance control by reducing wheel-spin and the latest generation of ABS processor provides ideal anti-lock levels. EBC monitors crankshaft de-acceleration under heavy braking and administers RbW throttle opening to maintain optimum grip.

Race Riding Mode

The Race Riding Mode provides the track rider with an unrestricted 195hp with direct RbW throttle response and, on the 'S' version, an instant track-oriented suspension set-up. Race mode also reduces the DTC system intervention, provides a race-oriented EBC and front-only ABS with reduced anti-rear-lift-up and instantly reconfigures the instrumentation layout with a track-oriented display.

Sport Riding Mode

The Sport Riding Mode provides the road or track rider with 195hp, delivered with a "smooth" RbW throttle response and, on the 'S' version, a sport-oriented suspension set-up. Sport mode slightly increases the DTC system intervention, provides a sport-oriented both EBC and front and rear ABS with increased anti-rear-lift-up.

Wet Riding Mode

The Wet Riding Mode provides the road or track rider with 120hp, delivered with a "smooth" RbW throttle response, increased DTC system intervention, environment-appropriate EBC, DQS off and fully enhanced ABS and, on the 'S' version, a suspension set-up optimised for low grip conditions.



Thin Film Transistor instrumentation (TFT)

The 1199 Panigale instrumentation takes Ducati's industry-leading Thin Film Transistor (TFT) screen to the next level with a stunning race-derived unit that embraces the very latest information display technology. The full colour display automatically changes its layout according to the Riding Mode selected in order to provide optimum clarity of information appropriate to the motorcycle's environment, even reversing its character and background colours in low-light conditions.

The high-definition instrumentation displays RPM from 1000-12,000 in a scale that curves through 90° around the left and upper edge of the main screen, incrementally adding bars of light around the display as the engine speed increases, while enlarging each of the main 1-12 numbers in the scale as each value is reached. During the first 1000km running-in period, the "orange section" of the rev-range automatically moves down from its normal 10,500 lower level to 6,000rpm. When the running-in period is completed, the orange section automatically returns to its 10,500-11,500rpm range, although during each engine warm-up, it is programmed to start from 8,000rpm, increasing to 9,000 and finally to its normal 10,500rpm position when the engine reaches normal working temperature.

Along the bottom of the screen from left to right, is the current status and/or setting of Riding Mode, ABS (if equipped), DTC, DQS and EBC and on the right of the screen, an easy-to-read gear indicator displaying from N to 6 with the top left corner of the screen displaying the time.

In "Road" and "Wet" Riding Modes the vehicle speed takes precedence in the centre of the display with large numerals, while two framed "additional information" panels, situated below, present total mileage by default on the left and engine coolant temperature on the right. Both left and right readings are scrollable while riding to read trip 1, trip 2 and fuel reserve trip on the left info frame with the scroll-up button on the switchgear. Actual and average fuel consumption, average speed, journey time and air temperature appear on the right info frame with the scroll-down button.

In "Race" Riding Mode, the display automatically reconfigures, moving the lesser important vehicle speed to the lower left info frame and making way for the latest lap time to be displayed large in the centre of the screen. When actuated, the lap time facility is triggered manually by using the flasher button on the switchgear or automatically with the new GPS equipped DDA+.

When the 1199 Panigale is stationary, the instrumentation is also used as a user-friendly control panel to personalise ABS, EBC, DES, DTC, DQS, and RbW settings within each Riding Mode before saving. In addition to listing the last 30 recorded lap times, each time also shows the lap number and the maximum speed and maximum rpm recorded during that lap.

Fixed icons on the left of the main screen from top to bottom show warnings for left turn signal, main beam, ABS-off and neutral, while from top to bottom on the right of the display are turn signal right, oil pressure, fuel reserve and engine electronics. Countdown icons are programmed to appear on the screen to advise of upcoming scheduled maintenance. A strip of red lights rising on the right and left outer edges and across the top of the instrumentation illuminate incrementally upwards to warn of over-rev. The first 25% at 10,500rpm, 50% at 10,700rpm, 75% at 10,900rpm and 100% as both strips meet and the top centre bar starts to flash. Below the top, centre over-rev bar is a second bar that illuminates in orange during DTC interaction.



Ducati Data Analyser+ (DDA+)

The Ducati Data Analyser (DDA) consists of a software download and a USB-ready data retrieval card and evaluates the performances of the bike and its rider by graphically presenting specific channels of information.

DDA+ is the latest generation of the system and introduces a GPS function that automatically records lap-times every time the 1199 Panigale crosses a circuit start/finish line. As the rider crosses start and finish line and presses the lights flasher button, the innovative system logs the coordinates of that position and then automatically logs each lap time as the motorcycle completes subsequent laps.

DDA+ is fitted as standard equipment on the Tricolore version and available for the 1199 Panigale and Panigale S as a plug-and-play accessory by Ducati Performance.

An essential piece of equipment for the circuit, DDA records numerous channels of data including throttle opening, vehicle speed, engine rpm, gear selected, engine temperature, distance travelled, laps and lap times. An additional channel of information is also dedicated to recording the DTC index which can then be viewed as a graphic trace indicating the amount of DTC interaction during wheel-spin. At the end of a ride or track session, data can be downloaded ready to compare, analyse and get an inside view of the performance of the rider and motorcycle.

Ducati Electronic Suspension (DES)

The 'S' versions of the 1199 Panigale are equipped with Öhlins suspension that and feature the innovative Ducati Electronic Suspension (DES). The technology enables front and rear rebound and compression damping adjustments to be controlled automatically by using the pre-set Riding Modes, which have been developed by Ducati test riders and racers, or in independent mode, allowing riders to use their own personal and saveable settings. Digital damping adjustments made via the instrumentation send signals that execute the mechanical adjustment via electronic actuators mounted inside the suspension units.



Ducati Traction Control (DTC)

Ducati's highly successful DTC system has been refined for the 1199 Panigale and fully integrated into the electronics package of all versions. It uses the same software logic developed and used by Ducati Corse for their MotoGP and World Superbike motorcycles and offers a choice of eight settings developed by a team of professional test riders and racers.

Accessible from the left-hand switchgear and displayed on the TFT instrumentation, the system offers a choice of eight profiles, each one programmed with a wheel-spin tolerance graded from one to eight. While level eight administers a confidence-building, high level of interaction from the system by activating upon the slightest detection of wheel-spin, level one offers a much higher tolerance and so reduced intervention for highly competent riders. The DTC system status and level is constantly displayed on the instrumentation, reminding the rider of the current interaction level if the Riding Modes is changed.

When the level that best suits the combination of road or track conditions and riding style has been selected and the DTC system activated, front and rear wheel sensors compare speed differential to sense when rear traction is being broken (wheel-spin). DTC then decides the best combination of two different types of instant electronic adjustment, calculated with data supplied from multiple sources.

The first 'soft' stage of system interaction is executed by high speed software that makes instant electronic adjustment to the ignition timing, administering varying amounts of ignition retardation to reduce the engine's torque. If the DTC software detects that the first 'soft' stage of system interaction is inadequate to control the wheel-spin, it continues to administer ignition retardation and, in addition, instructs the engine ECU to initiate a pattern of constantly increasing injection cuts until, if necessary, full injection cut.

During both stages of system interaction, an orange warning light, which is visible in the rider's peripheral vision and situated across the top of the instrumentation, illuminates to signify that DTC has is being used. As soon as the system recognises the gradual return of equal wheel speeds, it incrementally re-establishes normal power delivery. This seamless interaction is key to the super-smooth operation of the system.

Ducati Quick Shift (DQS)

The Ducati Quick Shift (DQS) system, first used on the 2011 1198 SP, was the first electronic quick-shift supplied as original equipment on a production Ducati. The 1199 Panigale takes that same technology and makes it even more compact. Normally used specifically for racing, the system allows the rider to keep the throttle open when changing-up through the gearbox, helping to save vital fractions of a second in the pursuit of faster lap-times. The system not only saves time when changing gear, but also enables the possibility of uninterrupted air flow through the throttle bodies throughout the upward gear-changing process.

The system consists of a micro-switch built into the linkage of the gear change lever, which when actuated in the direction of selecting a higher gear, sends a signal to the main ECU. The ECU instantly understands which gear the motorcycle is in by calculating the rpm and vehicle speed and then reads the amount of throttle opening before applying a pre-programmed cut in fuel injection and ignition measured in milliseconds. This split-second electronic interruption in drive is programmed precisely to allow the next gear to be selected without having to actuate the clutch or close the throttle. As the system only functions for a matter of milliseconds, the 1199 Panigale can still be ridden using a normal gear-changing style.



Engine Brake Control (EBC)

The "Engine Brake Control" (EBC) system was developed by Ducati Corse to help riders optimise vehicle stability under extreme corner-entry racing conditions by equalising the positive and negative forces of torque subjected to the rear tyre under severe engine-braking conditions. EBC monitors throttle position, gear selected and crankshaft de-acceleration rate under heavy braking and administers precise RbW throttle openings to balance the torque forces acting on the tyre. EBC has a three level operating system accessible from the 1199 Panigale's instrumentation and is integrated automatically into its three Riding Modes to provide an additional and highly effective rider aid.

The "Superquadro" power house

Ducati's latest engine, the Superquadro, goes beyond the barriers of engineering to enable the 1199 Panigale. Its no-compromise approach to design, combined with Ducati's Italian innovation has set the most extreme benchmark ever and stands as the latest milestone in Ducati's long and iconic history of Superbike engines.

Ducati engineers were given a near impossible design brief to create the latest generation Superbike engine for the Ducati 1199 Panigale. Increase power, torque and user-friendliness and reduce overall vehicle weight and scheduled maintenance costs seemed impossible tasks, but given a "blank canvas" to create the new power-plant and encouraged to think outside-of-the-box to achieve the unachievable, engineers finally ticked all the boxes.

The innovative Superquadro engine, so called because of its massively over-square bore and stroke ratio, increased power to an absolute production twin-cylinder milestone of 195hp and torque to 98.1 lb-ft (13.5kgm) with user-friendly Riding Modes that deliver power appropriate to the rider's style and environment. Its construction has enabled a radical reduction in overall vehicle weight and, further identifying Ducati's constant pursuit of performance perfection, major services have been extended to 24,000km (15,000 miles).



Engine architecture

With the engine designed to be a fully stressed member of the chassis, its architecture has been completely re-calculated to provide the best possible vehicle construction for layout, weight distribution and strength. The cylinders, which remain at 90° to each other, have been rotated backwards around the crankcases by 6°, until the front cylinder is 21° from horizontal. This has enabled the engine to be positioned 32mm further forwards for improved front / rear weight distribution in addition to perfectly positioning the cylinder head attachment points for the 1199 Panigale's monocoque frame.

The crankcases, which are vacuum die-cast using Vacural® technology to ensure optimal weight saving, consistent wall thickness and increased strength, also incorporate the outer water-jacket of the "cylinder", eliminating the jointing face that used to exist at the base of the cylinders. Instead, the Superquadro has separate nikasil-coated aluminium "wet-liners" inserted into the tops of the crankcase apertures. This design enables secure fixing of the cylinder head directly to the crankcase, improved sealing and enhanced heat dissipation from the thin cylinder-liners directly into the surrounding coolant.

The primary-drive casing, clutch casing and outer cover, sump and cam covers are all cast in magnesium alloy, ensuring a lightweight engine despite its increased strength as an integral part of the chassis.

In addition to cylinder position, the crankcases use shell main bearings for the crankshaft, previously only used by Ducati on the Desmosedici RR engine. Removing the roller bearings has enabled an increase in diameter of the crank journals for enhanced rigidity and an increase the crankcase section around the main bearing area for improved strength in line with the Superquadro's extreme power output. For 2013, the new 1199 Panigale R goes one step further with the introduction of titanium con-rods, which save 0.63kg (1.38lb) and a new, lightweight crankshaft flywheel, saving a further 0.7kg (1.54lb). The shell bearings are force-fed oil from internal drillings within the main bearing pillars to keep the new crankshaft well lubricated and is quickly scavenged back into the sump with the introduction of a new Ducati feature, a highly efficient GP-style vacuum pump.

The pump is driven by the main oil pump shaft and effectively maintains constant vacuum in the crankcase area below the pistons, reducing atmospheric resistance during the down-stroke of the piston and controlling the internal "breathing" of the engine.



Extreme dimensions

In calculating the optimum configuration for the big step forward in power output for the L-twin engine, Ducati and Ducati Corse engineers increased engine speed and enhanced breathability with the incredible bore and stroke of 112mm x 60.8mm (4.40x2.39in). The intense study of power and rideability resulted in an output of 195hp @ 10,750rpm and 98.1 lb-ft (13.5kgm) @ 9,000rpm. The bore and stroke ratio of 1.84:1 effectively increases rpm with the ultra-short stroke of the crankshaft and increases the cylinder area to enable increased valves diameters. Inlet valves increased from 43.5 to 46.8mm (1.71-1.84in) and exhaust valves from 34.5 to 38.2mm (1.35-1.5in).

With such large inlet valves operating at higher rpm, the intense inertial forces have been controlled by using titanium instead of steel, a solution only previously used on full "R" models. The valves are actuated by, 'super-finished' rocker arms for reduced friction and fatigue and then coated in polymeric-like carbon (PLC) - a process originally developed for the aerospace industry - and diamond-like carbon (DLC) on the new 1199 Panigale R.

The race-derived Superquadro pistons have a distinctive double-ribbed undercrown to achieve high strength and reduced friction by using minimal piston wall surface area. Using technology developed by Ducati Corse, the design enables reliable operation of the 112mm diameter pistons when performing at high rpm.

The improved volumetric efficiency of the increased inlet valve diameters is further capitalised on by increasing the oval throttle body dimensions from an equivalent diameter of 63.9 to a massive and high-flowing 67.5mm (2.66in). The Ride-by-Wire throttle bodies feed air across twin injectors per cylinder, one positioned below the butterfly for enhanced flexibility and one above for outright power.

Clean power

With such enhanced "breathing", the challenge for the Superquadro's design engineers was to program performance-optimised fuel mapping for a smoother cycle-to-cycle engine operation, without compromising emissions. To achieve this, Ducati introduced a secondary air system that completes the oxidation of unburned hydrocarbons and effectively reduces HC and CO levels. The system is activated when the engine ECU recognises specific conditions in the engine's operation via the lambda and throttle opening sensors. It then opens a valve enabling a flow of clean air from the main airbox to a reed valve situated in each cylinder head, which enables one-way flow into an air gallery exiting into the exhaust port close to the exhaust valve. Entering the hottest point of the exhaust gasses, the fresh charge of air enhances the burn environment, eliminating any unburned fuel that escapes during the exhaust cycle under certain conditions.

Desmo dependent

Never before has Ducati's unique Desmodromic system been so vitally important. With the high engine speeds at which the Superquadro operates combined with such incredibly large valves, it would be impossible for the valve's rocker-arm to follow the steep closure profile of the cam lobe using normal valve closure springs. The Desmo system actuates valve closure mechanically with the same method and accuracy as it opens, enabling steep cam profiles, radical cam timings, large valves and high operating speeds. This system is used on every single Ducati motorcycle and is constantly proven on Ducati Corse's World Superbikes and Desmosedici GP bikes.



The power of precision

Controlling such large valves with the precise Desmodromic system also led engineers to replace the original belt-drive system, used since the introduction of the Ducati Pantah in 1979, with a combined chain and gear-drive arrangement. The conventional bush-type chain runs from the crankshaft to the cylinder head where a single sprocket positioned between inlet and exhaust camshafts, is attached back-to-back to a gear wheel mounted on its own short, dedicated shaft. The attached gear meshes directly with gears on the ends of both the inlet and exhaust camshafts, which are also designed with +/- position adjustment for ultra-precise cam-calibration. The cam chain, therefore, provides highly efficient point-to-point drive route and, tensioned automatically, provides continuous reliability, further reducing the cost of routine maintenance.

On the end of each exhaust cam drive gear is a centrifugal flyweight which retracts at speeds below tick-over to rotate a "protrusion" from the concentric section of the cam, thus creating sufficient valve lift to act as a de-compressor. This ingenious device enables the Superquadro engine to be started easily without using a larger battery and starter motor, which has reduced overall vehicle weight by approximately 3.3kg (7.3lb). When the engine starts and the camshafts begin to rotate at tick-over speed, the centrifugal flyweight flicks out, retracting the "protrusion" back into the cam and allowing complete valve closure for full compression. This innovative feature further underlines the lengths to which designers and engineers have worked together in the single-minded pursuit of weight-saving.

Transmission

Ducati's engineers also capitalised on the opportunity of the "blank canvas" project to increase dimension between the centres of the six-speed gearbox shafts, enabling larger diameter, stronger gears to transmit the enhanced power output. The Panigale is the first top-of-the-range Ducati Superbike to use a "wet", oil-bath clutch. Based very closely on the design of the Multistrada and Diavel components, the clutch assembly features a "slipper" function and a progressive self-servo mechanism that compresses the friction plates when under drive from the engine. While enhancing frictional efficiency, this also results in a rider-friendly light clutch lever "feel" at the handlebar. Conversely, when the drive force is reversed (over-run), the mechanism reduces pressure on the friction plates, enabling a true racing "slipper" action, reducing the destabilizing effect of the rear-end under aggressive down-shifting.