

The new BMW S 1000 RR. Contents.



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1. Overall Concept and Features.

Scarcely two years after the launch in 2009, BMW Motorrad is now presenting the revised model of this successful supersports bike, now with many optimised details. The primary objectives were even greater riding precision and agility, a punchier power buildup, and a more sensitive response. The revised model of the S 1000 RR has incorporated quite a few feedback reports from national super stock races.

Like its predecessor, the new RR knows no compromise, providing the highest level of sporting character and riding dynamics. The convincing features of the new S 1000 RR are its improved handling with absolute riding stability, supreme engine performance with perfect everyday practicality, and a resounding dynamic performance. The highest level of active safety is safeguarded by the most advanced brake system today on the market, the BMW Motorrad Race ABS. When accelerating, the rider is supported by the Dynamic Traction Control system DTC. Both of these systems have been optimised for the perfect interaction.

There have been no changes to the superior engine power of 142 kW (193 hp) with a weight of only 204 kilograms including 90% fuel (206.5 weight with Race ABS).

Concept with optimised riding dynamics.

One of the primary objectives pursued for the revised S 1000 RR model was to improve rideability by boosting thrust and enhancing the linearity and harmoniousness of the power and torque curves. The reconfigured throttle improves overall response.

The new, optimised design raises response sensitivity, tightens the twistgrip angle, and reduces the twisting force.

Suspension with improved handling and feedback.

The modifications to the new RR suspension have been instrumental in boosting its riding dynamics. For instance, the upside down fork and the spring strut feature a new internal structure, providing an even wider range of damping forces from comfort to performance.

Moreover, the suspension geometry has been modified with new values for the steering head angle, offset, position of the swing arm pivot, fork projection, and spring strut length to yield even better handling, steering accuracy, and feedback for the new S 1000 RR. This has required modifications to the main frame that also included enlarging the cross sectional area of the intake air guide through the steering head for greater air flow efficiency. This package of suspension optimisations is rounded off by an adjustable mechanical steering damper.

Instrument cluster with new functions.

The engine speed display has been redesigned for better readability. In addition, the display can now be dimmed and provides more functions. For instance, the lap timer can now present “Best lap in progress”, and if required, “Speedwarning” can inform the rider when he exceeds a particular speed.

Refined design and new colours.

The new S 1000 RR not only benefits from the advanced developments for the engine, suspension, and cockpit. It has also gained yet another step ahead in terms of design. The tail section now presents a considerably leaner look. There have been some discrete changes to the asymmetrical side panels, and the centre airbox cover now sports side aperture grilles. On the top part of the panels, a new, telling identifying feature takes the form of two winglets that enhance the aerodynamic qualities.

In the most sporting colour combination of Racing red and Alpine white, the RR exudes power and speed even when it is stationary, whereas plain Bluefire lends it a decidedly extravagant look.

Sporty dynamics is conveyed by Sapphire black metallic, and in BMW Motorrad Motorsport colours, the new S 1000 RR testifies to its direct relationship with BMW Motorrad Motorsport. The distinctive RR logo has been slightly modified.

Additional visual accents take the form of wheels painted in glossy black and the red spring in the central strut. The matching swing arm either presents an anodised coating or is kept in black.

Also the ergonomics has been improved in the form of new heel plates for the rider. The stabilisers on the passenger footrests have now been designed for a leaner look.

Extended range of optional extra and special equipment.

For individualising the new S 1000 RR, BMW Motorrad is expanding its range of optional extras and special equipment ex works with a number of attractive features. Riders with a particularly sporty bent can now equip their RR with an HP titanium exhaust system (with or without ABE) or the HP race data logger. Also the heated grips offering two levels and fitted as optional extra can take the bite out of the early morning run on the racetrack or longer rides in cold weather.

The new features at a glance

- Optimised torque curve for improved ridability.
- Expansion from two to three performance curves (one each for Rain and Sport modes and an additional one for Race and Slick modes); Rain mode now 120 kW (163 hp).
- Reconfigured throttle for enhanced response (particularly gentle and sensitive acceleration in Rain mode, and immediately direct and spontaneous response in Sport, Race, and Slick modes).
- Reduced twisting force and tighter twistgrip angle.
- Smaller secondary ratio for boosted thrust.
- Refined tuning between Race ABS and Dynamic Traction Control (DTC).
- Enlarged cross sectional area of the intake air guide through the steering head for greater air flow efficiency.
- Better handling, steering accuracy, and feedback.
- Revised spring elements for an even wider range of damping forces.
- Suspension geometry modified with new values for the steering head angle, offset, position of the swing arm pivot, fork projection, and spring strut length.
- New mechanical steering damper adjustable over ten levels.
- Forged and milled fork bridge in a new design and with a smaller offset.
- Revised design with a leaner tail section, redesigned side panels, centre airbox cover with side aperture grilles, and winglets.
- For new colour variants: plain Racing Red with Alpine white, Bluefire, Sapphire black metallic, BMW Motorrad Motorsport colours.
- Revised RR logo.

- New heel plates and leaner stabilisers on the passenger footrests.
- Redesigned LCD engine speed display for better readability and with five dimming levels.
- Instrument cluster with the new functions “Best lap in progress” and “Speedwarning”; deactivation of “Lamp” fault message when headlamp or number plate carrier removed.
- Catalytic converters relocated, so no heat shield necessary.
- Expansion to the optional extras and special equipment ex works.



2. Drivetrain.

Just as before, the S 1000 RR sports the water cooled four cylinder inline engine of solely 59.8 kg delivering a top power output of 142 kW (193 hp) at 13,000 rpm and a top engine speed of 14,200 rpm. The max torque of 112 Nm is reached at 9750 rpm.

Reconfigured throttle for improved overall response.

The primary objective in this next level of development for the new RR was to target the powertrain for combining the outstanding engine power with even greater rideability. To this end, the throttle was first reconfigured in engine control. To date, engine control consisted of four individual throttle curves for each of the Rain, Sport, Race, and Slick modes. For the new RR, these have been reduced to two: a characteristic curve for a particularly gentle and sensitive throttle in Rain mode, and a second for immediately direct and spontaneous response in the Sport, Race, and Slick modes. Following this measure, the rider now no longer needs to adjust to the constantly changing throttle characteristics when switching frequently between Sport, Race, and Slick modes. At the same time, this also served to optimise the load change behaviour.

For particularly sensitive and fast regulation, the throttle valve now features a supporting spring with a low spring rate that reduces the actuating force. And the twisting angle is now considerably smaller on the new twistgrip throttle.

Optimised power and torque curves and lower secondary ratio.

The higher priority objective of the best possible rideability also included the optimisation of the power and torque curves.

Three new power curves have been defined: one each for the Rain and Sport modes and an additional one for the Race and Slick modes (in contrast to earlier, when there was one for the Rain mode and a second for the Sport, Race and Slick modes). With an eye to improving acceleration and thrust properties, we have reduced the secondary ratio from its former 17:44 to its present 17:45.

In Rain mode, the new S 1000 RR now delivers 120 kW (163 hp), or 8 kW (11 hp) more than previously. In Sport, Race, and Slick modes, the RR can still deliver a top power output of 142 kW (193 hp), but the power could be significantly raised especially in the lower speed range between 5000 and 7500 rpm. The result is essentially more linear and punchier engine characteristics.

Also the torque curves have been redefined for the purpose of improved ridability. So the new RR now offers three different torque curves (previously two): one each for the Rain and Sport modes and an additional one for Race and Slick. All four modes benefit from the greater harmony and linearity of the torque curve. In addition, the new S 1000 RR delivers in all four modes a considerably greater torque in the 5000–7500 rpm range. And particularly in Rain mode, the RR offers considerably improved ridability. Whereas the torque curve for the predecessor model virtually plateaued from 4500 rpm, the new engine now revs up more freely, and the curve rises to over 9000 rpm.

New combustion control in the overrun phase.

For uncompromising sporting characteristics with treadless tyres on the racetrack, Slick mode has been reconfigured for enhanced performance. This involved a series of modifications to the characteristic map for overrun phase combustion that effectively eliminated permanent overrun fuel cutoff. Now, overrun phase combustion control converts braking torque and engine drag torque into an optimised retarding torque on the rear wheel. The result is even greater riding and directional stability during braking and turning.

Modified stainless steel exhaust system and optimised intake air guide.

The all stainless steel exhaust system on the S 1000 RR features a redesigned catalytic converter and front pipes. Fitted previously in the front pipes, the catalytic cartridges are now integrated in the front silencer. The interactions between the 20% larger cross section of the intake air guide in the steering head, the modified airbox, the new bellmouth geometry, and modified engine application all served to increase the torque as described above. These modifications to the exhaust system now eliminate the need for the heat shield installed previously on the oil sump.

Dynamic Traction Control (DTC) with enhanced control performance.

When unveiled in 2009, the S 1000 RR was the first series supersports bike in the world to combine Race ABS with Dynamic Traction Control (DTC). The fact that BMW Motorrad could implement these two technologies with such ease proved to be so convincing that nearly 100% of the vehicles leaving production are fitted with these two systems. Both systems have seen continued optimisations in the course of technical advances.

Dynamic Traction Control (DTC) is a rider assist system with a lean angle sensor that supports the rider and provides him with that extra safety on roads with compromised coefficients of friction. Following the laws of physics, it regulates the transferred drive torque, preventing the rear wheel from spinning in nearly all situations.

For the new RR, modifications have been made to reflect the new geometry, and wheelie detection has been optimised. When wheelie detection engages, the throttle valves now open much more gently. Moreover, Dynamic Traction Control (DTC) has been optimised for greater riding and control performance in the Race and Slick modes.

The new DTC application is based on the BMW Race Power Kit for better transparency during highly sporty manoeuvres on the racetrack. The experienced rider can therefore achieve faster lap times.



3. Suspension.

The S 1000 RR boasts innovative suspension technology for the highest level of supersports performance. The refinements made to the suspension have focused particularly on enhancing agility, handling, and inclined stability. In addition, the modifications lead to greater suspension reserves and an enhanced feeling for all situations and the threshold level. In short, the new RR feels even lighter and more manoeuvrable, but without sacrifice to riding stability.

New suspension geometry for better handling and greater steering accuracy.

The new S 1000 RR features a modified frame with a new steering head and tail section. Besides new key figures for the geometry there is also a 20% larger cross section of the intake air guide in the steering head. The steering head angle is now 66° instead of the earlier 66.1°. The wheelbase has now been shortened by 9.3 mm to 1422.7 mm, and the afterrun has been lengthened by 2.6 mm to 98.5 mm. The fork bridge offset (front end) is now 2.5 mm shorter at 29.5 mm. In addition, the fork projection is 5 mm shorter than in the predecessor model. These modifications also included revisions to the steering head bearing for a lower breakaway torque and hence greater steering precision.

Redesigned spring elements for a wider range of applications.

The new spring elements now allow a wider range of suspension configurations between comfortable for the road and tight for the racetrack. As before, the suspension can be configured quickly and easily at the clearly defined scales on the spring elements. The new suspension adjustment now benefits riders on both country roads and the racetrack. Internal friction has been minimised on the fork and spring strut. This has resulted in a considerably optimised response, and the rider can now recognise the threshold level with far greater ease.

Upside down fork with new inner workings.

To date, the upside down fork on the S 1000 RR was fitted with bottom valve damping. Now featuring a mid speed damping valve, the fork can now utilise additional force at the working piston to build up compression damping with

greater speed and precision. Also, the constant flow area has been reduced for improved feedback from the front section. The piston rod guide and the bearing concept have been revised for a better, more transparent response.

New spring strut with revised damping.

The central spring strut now features a piston rod whose diameter has been increased from 14 to 18 mm, allowing more oil to flow through the low/mid speed valve. Here too, the reduction to the constant flow area increases the rate and precision of compression damping buildup.

At the same time, the needle geometry has been modified on both valves and now allows a highly linear buildup of damping force over the whole range of settings. All in all, these modifications to the buildup of damping forces greatly enhance the effects and feelings conveyed by each configuration.

A check valve installed in the piston rod counteracts any negative effects on compression damping when the rebound is being set.

Also the spring strut now presents a smaller constant flow area for improved feedback.

Overall, the new RR offers considerably greater ride comfort at the same time as greater feedback and dynamics.

Race ABS with fine tuning and clear feedback.

The Race ABS on the S 1000 RR has been developed specifically and exclusively for the requirements on the supersports segment. For the new RR, it has been adapted to the new suspension geometry and now provides optimised control performance. An adaptive learner, it recognises the requirements even of highly experienced riders and detects diverse road conditions and tyres.

By pressing the lever, the rider receives feedback from the Race ABS as to when the traction limit will be exceeded and the control range reached. The rider feels controller feedback as a slight pulsing in the brake levers.

New mechanical adjustable steering damper.

Unlike its predecessor, the RR now features a mechanical steering damper adjustable over ten levels. This allows the rider to choose the configuration best suited to his riding style.

New coated swing arm and new swing arm bearing bush.

Depending on the S 1000 RR paintwork, the rear wheel swing arm is either anodised or provided with a black, cathodic dip coating in lieu of the earlier Ostra grey paint.

The swing arm bearing bush in the frame's tail section is now secured in place with the one screw (instead of two as in the predecessor model) at a position 4 mm higher for the full effect of the optimised suspension geometry.

New heel plates.

The heel plates have been redesigned for the optimal ergonomics. The stabilisers on the passenger footrests have also been redesigned.

Fork bridge in a new design.

The forged and milled top fork bridge for the RR now presents a new design as a visual constituent of the cockpit always in view of the rider. The fork bridge offset is now 2.5 mm shorter at 29.5 mm.



4. Electric and Electronics.

Redesigned rev counter and dimmable LCD display.

The rev counter has been redesigned for better readability. The LCD display now offers five dimming levels and provides a number of additional interesting functions. The display now presents a symbol representing the new heated grips available as optional equipment ex works.

“Best lap in progress” for the racetrack.

The integrated lap timer now displays “Best lap in progress”. When on the racetrack, the rider can then see in real time (100 m intervals) whether his present lap is faster or slower than his fastest lap so far. This provides invaluable assistance to riders with sporting ambitions. On every lap, the current lap time is compared with the “Best lap” time. When the current time is better, the “Best lap in progress” (BLP) lamp lights up green. When the time is slower, the BLP lamp goes out.

“Speedwarning” function for everyday support.

The function “Speedwarning” signals to the rider when he exceeds a particular speed he has defined. When the speed limit is exceeded, the shift lamp lights up and the word “SPEED” appears on the display.

Option for deactivating the lamp fault display.

For racing without a headlamp or number plate carrier (direction indicators), the lamp fault display now presents a deactivation option that disables this fault symbol.



5. Body and design.

Highest dynamics, functionality, and unmistakability in design.

The lightness the new S 1000 RR conveys when running is also reflected in the look of greater dynamics presented by this highly dedicated sports bike.

Immediately conspicuous is the far leaner tail section. The centre airbox cover sports new side aperture grilles. The asymmetrical side panels so characteristic of the RR, with gills on the right and air outlet on the left, have experienced some discreet refinements in their design.

These are joined by the new air deflectors, the so called winglets. These not only lend the new RR its look of greater dynamics, but also boost its aerodynamics by dissipating the wind pressure on hands and arms at high speeds.



6. Range of Equipment.

For even greater individualisation of the S 1000 RR, BMW Motorrad offers an extensive range of optional accessories and optional equipment ex works. Special equipment is delivered directly ex works and is integrated in the production process. Special accessories are installed at BMW Motorrad dealerships. The motorcycle can therefore be fitted with options after it has left the factory.

The equipment options already available for the S 1000 RR have now been supplemented with the following.

Optional Extras.

- Heated grips with two levels.

Special equipment.

- HP titanium exhaust system street legal / non-street legal.
- HP winglets of CRP.
- HP race data logger with GPS.

This offer is rounded off with the familiar, high quality collection of rider's gear, HP parts and the **HP race parts** designed specifically for the S 1000 RR.

- HP race power kit.
- HP race calibration kit.
- HP race cover kit.
- HP race shift pattern reversal.
- HP race footrest plate.

In addition, **BMW Motorrad HP Race Support** assists all customers who want to use their RR at a higher professional level on the racetrack.

7. Colours.



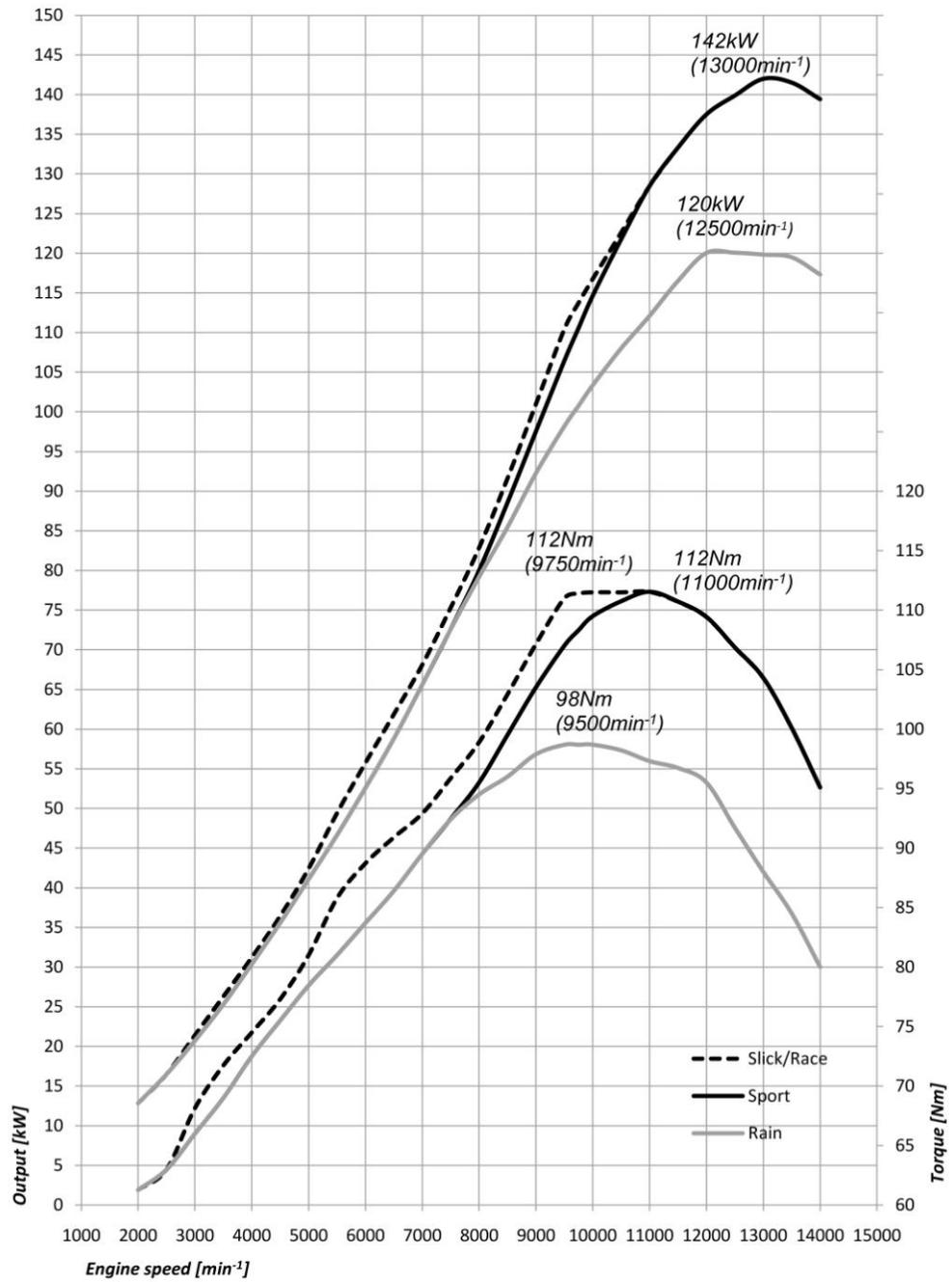
New colour concept for sporty dynamics.

The colour concept for the S 1000 RR plays with the contrasts presented by the black bridge frame, the filigree wheels with glossy black paint, and the stubby rear silencer of stainless steel. The look of sporty dynamics is underscored by the two arm swinging fork with anodised or black cathodic dip coating. On all colour variants, the red spring in the central strut provides an additional visual accent.

The new RR will be offered in four colour variants. In the particularly sporty colour combination of Racing red and Alpine white, the S 1000 RR exudes power and speed even when it is stationary, whereas Bluefire underscores the extravagance of the supersports bike. Sporty dynamics is borne up by Sapphire black metallic, and the BMW Motorrad Motorsport colours, which testifies to the direct relationship with BMW Motorrad Motorsport.

The distinctive RR logo has been slightly modified.

8. Engine output and torque.



9. Specifications.



BMW S 1000 RR		
Engine		
Capacity	cc	999
Bore/stroke	mm	80/49.7
Output	kW/hp	142/193
At engine speed	rpm	13,000
Torque	Nm	112
At engine speed	rpm	9750
Type	Water cooled straight 4-cylinder engine	
Compression/fuel	13:1/min. premium unleaded (95 RON)	
Valve actuation	DOHC (double overhead camshaft) valve actuation over individual rocker arms below	
Valves per cylinder	4	
Intake/exhaust Ø	mm	33.5/27.2
Throttle valve diameter	mm	48
Carburetion	Electronic fuel injection, digital motor electronics BMS-KP	
Emission control	Two regulated three-way catalytic converters, EU-3	
Electrical system		
Alternator	W	350
Battery	V/Ah	12/10, maintenance free
Headlight	W	Low beam 1 x H 7 / 55 W High beam 1 x H 7 / 55 W
Starter	kW	0.8
Gearbox power transmission		
Clutch	Multiple disc antihopping clutch in oil bath, mechanically operated	
Gearbox	Constant mesh six speed gearbox	
Primary ratio	1:1.652	
Gear transmission ratios	I	1:2.6471
	II	1:2.091
	III	1:1.727
	IV	1:1.500
	V	1:1.360
	VI	1:1.261
Rear wheel drive	Chain	
Transmission ratio	1:2.647	
Chassis		
Frame type	Bridge frame of aluminium	
Suspension, front	Upside down fork, standpipe diameter 46 mm, adjustable compress and rebound	
Suspension, rear	Two arm swinging fork with central spring strut, in spring mount, adjustable compress and rebound	
Spring travel front/rear	mm	120/130
Wheel castor	mm	98.5
Wheelbase	mm	1422.7
Steering head angle	°	66

Brakes	front	Hydraulically actuated double disc brake with BMW disc mount, Ø 320 mm, radial 4-piston fixed callipers
	rear	Hydraulically actuated single disc brake, Ø 220 mm, single-piston floating calliper
ABS		Optional equipment BMW Motorrad Race ABS (partially integral, disengageable)
DTC		Optional equipment BMW Motorrad DTC (disengageable)
Wheels		Cast aluminium wheels
	front	3.50 x 17"
	rear	6.00 x 17"
Tyres	front	120/70 ZR17
	rear	190/55 ZR17

Dimensions and weights

Overall length	mm	2056
Overall width with mirrors	mm	826
Seat height	mm	820
DIN unladen weight, ready for road	kg	204 (206.5 with Race ABS)
Permitted total weight	kg	405
Fuel tank capacity	l	17.5
Dry weight	kg	178

Riding data

Fuel consumption		
90 km/h	l/100 km	5.7
120 km/h	l/100 km	5.9
Acceleration		
0-100 km/h	s	2.9
0-1000 m	s	17.9
Max speed	km/h	> 200