

The new BMW M 1000 RR.

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1. Overall concept. Short version.



"We have achieved an engineering masterpiece in the aerodynamic development of the M RR due to our unwavering ambition, total passion and technical finesse. Thanks to countless hours in the wind tunnel as well as in road tests, we were able to considerably increase the top speed with unchanged engine output and at the same time significantly increase the downforce, also when banking in corners. Our development work will be rewarded with racing success." Christian Gonschor, Project Management M 1000 RR

Built for racing: The new M 1000 RR and M 1000 RR M Competition.

With the further development of the BMW M 1000 RR, M RR for short, BMW Motorrad is setting a new milestone in the field of superbikes homologated for racing. The new M RR is powered by the familiar water-cooled inline 4-cylinder engine designed for racing purposes, especially the Superbike World Championship. As before, its peak output is 156 kW (212 hp) at 14,500 rpm. The chassis of the new M RR also relies on the aluminium bridge frame as its centrepiece, supplemented by an upside-down fork and central suspension strut with Full Floater Pro kinematics. The new M 1000 RR is offered in two versions: As the M RR basic variant in the basic paint finish Lighwhite non-metallic and as the M RR M Competition in the basic paint finish Blackstorm metallic.

Massively increased top speed with significantly increased downforce thanks to new fairing, new M Winglets, new front wheel cover with integrated M Brake Ducts and new M Aero Wheel Covers.

The increased potential of the new M RR results above all from the colossal advancement in the aerodynamics area. In particular, a newly designed fairing made of exposed visible carbon fibre with a higher windscreen increases the top speed significantly in conjunction with optimised airflow around the rider. For the first time, this fairing also comes with a particularly light yet very rigid front fairing support made of carbon fibre. The top speed of the new M RR has increased from 306 to 314 km/h compared to the previous model. In addition, the M RR riders benefit from noticeable physical relief.

In the course of this aerodynamic development, the M Winglets were also completely revised. They now generate significantly more aerodynamic downforce - both in an upright riding position and when banking. The rider gains even more confidence with regard to the front wheel so he can achieve even greater lean angles or higher cornering speeds at the same lean angle as well as profiting from a reduced wheelie tendency. At the same time, the rider benefits from a massively increased top speed.

Another central point in optimising the entire aerodynamics was the area of the front wheel. Here, for the first time in the history of BMW Motorrad, brake cooling air ducts made of visible carbon fibre are used - also referred to as brake ducts in short. They are integrated into the new front mudguard, which has been optimised for improved airflow around the fork legs and brake calipers. The M Aero Wheel Covers, which are also made of visible carbon fibre lower air resistance even further - especially at speeds above 250 km/h. The M Aero Wheel Covers are reserved for the M RR M Competition.

M Carbon wheels with new surface and M Design Tapes. Forged wheels optionally available ex works.

In the new M RR, the M Carbon wheels stand out thanks to their new clear lacquer coat. New tapes in M design on the wheel rims underline the high-grade technical character and the racing claim of the new M RR. As an alternative to the M Carbon wheels, the new M RR can now also be ordered with forged wheels ex works.

Redesigned rear end, ergonomic M Endurance seat, short number plate holder and modified wiring harness.

A newly designed rear section makes the current M RR look even lighter, sportier and more dynamic. The short number plate holder

and the ergonomically designed M Endurance seat are also new features. Thanks to a modified wiring harness with LWS connector, the now shorter number plate holder with light units can be dismantled even faster and more easily.

The highlights of the new BMW M RR and M RR M Competition.

- M RR 4-cylinder developed for racing purposes.
- Output 156 kW (212 hp) at 14,500 rpm. • Maximum torque 113 Nm at 11,000 rpm.
- 2-ring forged pistons
- Fully CNC machined intake ports and BMW ShiftCam technology to vary valve timing and lift.
- Titanium valves, optimised camshafts and narrow and light cam followers.
- Very light, compact basic engine with longer and 85 g lighter Pankl titanium connecting rods for reduced friction and weight compared to the S 1000 RR.
- Anti-hopping clutch without self-boosting optimised for race starts.
- Optimised intake system with shorter intake funnels compared to the S 1000 RR for optimised charge exchange at high engine speeds.
- Lightweight exhaust system with titanium manifold, front silencer and rear silencer.
- **NEW:** Drastically optimised aerodynamics with more downforce even at lean angles, while at the same time increasing the top speed from 306 to 314 km/h.
- **NEW:** New fairing in visible carbon fibre with new fairing front carrier made of carbon fibre and new visible carbon fibre M Winglets.

- **NEW:** New visible carbon fibre front mudguard with integrated brake ducts.
- **NEW:** M Aero Wheel Covers made from visible carbon fibre.
- **NEW:** M Carbon wheels with new surface and M Design Tapes.
- **NEW:** Forged wheels optionally available ex works.
- **NEW:** Newly designed rear section.
- **NEW:** Ergonomic M Endurance seat.
- **NEW:** Short number plate holder.
- **NEW:** Modified wiring harness with LWS connector for even easier removal of the number plate holder with light units.
- Riding modes "Rain", "Road", "Dynamic", "Race" and "Race Pro 1-3" as well as the latest generation of Dynamic Traction Control DTC and DTC wheelie function with 6-axis sensor box.
- Two adjustable throttle characteristics available now for optimum response. "Engine Brake" with triple adjustability of engine drag torque in "Race Pro" mode.
- Shift Assistant Pro for fast upshifts and downshifts without using the clutch. The shifting scheme can be easily reversed for race track use.
- Launch Control for perfect race starts and Pit Lane Limiter for keeping to the given speed precisely in the pit lane.
- Hill Start Control Pro for comfortably starting off on inclines.
- M Brakes: Maximum braking performance on the race track.
- Instrument cluster with large, perfectly readable 6.5-inch TFT display, start-up animation with M logo and OBD interface for M GPS Datalogger and M GPS Laptrigger.
- Lightweight M battery, rear USB charging socket, powerful LED light units, electronic cruise control and heated grips.

- M Competition package with M GPS Laptrigger and activation code, M milled parts package, M Carbon package, natural anodised swinging arm 220 g lighter than the basic variant or that of the S 1000 RR, DLC-coated M Endurance chain and pillion package including hump cover.
- Extensive range of optional accessories and special equipment ex works.

2. Technology, aerodynamics and design.



New M RR base variant and new M RR M Competition.

The new M RR is available in two versions. As the M RR basic variant in the colour Lightwhite non-metallic for fuel tank, tank side panels, airbox cover and rear section, as well as the M RR M Competition in Blackstorm metallic for the fuel tank and tank side panels, supplemented by an airbox cover and a rear section in visible carbon fibre and a tinted windscreen. Both variants feature a lightweight, intricately crafted fairing in visible carbon fibre with M Design tapes.

Built for racing: The M RR 4-cylinder and the chassis are fine-tuned for use on the race track.

The new M RR uses the familiar water-cooled inline 4-cylinder engine designed for racing purposes and in particular for the Superbike World Championship. As before, its peak output is 156 kW (212 hp) at 14,500 rpm. The maximum torque of 113 Nm is reached at 11,000 rpm. The maximum engine speed of the M RR is 15,100 rpm.

Highlights of the engine include lightweight 2-ring forged pistons with optimised piston rings, narrow and lightweight cam followers, fully CNC-machined intake ports and BMW ShiftCam technology for varying valve timing and valve lift. Other indispensable components for a racing engine are titanium valves, optimised camshafts and longer titanium connecting rods from Pankl, each 85 g lighter than on the S 1000 RR engine, for reduced friction power and lower weight. The intake system features shorter intake funnels for optimised charge exchange at high engine speeds.

As before, the chassis of the new M RR relies on the aluminium bridge frame as its centrepiece, supplemented by an upside-down fork and central suspension strut with Full Floater Pro kinematics. The primary goal when designing the chassis and suspension was to achieve the best possible lap times on the race track. That's why the chassis of the M RR is uncompromisingly designed for the racetrack, but is nevertheless ideal for very sporty country road riding.

Massively increased top speed with significantly increased downforce thanks to new fairing, new M Winglets, new front wheel cover with integrated M Brake Ducts and new M Aero Wheel Covers.

The increased potential of the new M RR results above all from the colossal advancement in the aerodynamics area. Never before has BMW Motorrad invested more development work in a fairing through simulation, optimisation in the wind tunnel and testing on race tracks. The expertise of the BMW in-house motorsport department provided significant support in the design process.

For example, a newly designed fairing made of visible carbon with a higher windscreen provides a significant increase in top speed in conjunction with optimised airflow around the rider. Another positive effect of the new fairing is the now integrated protection of the M engine covers. For the first time, this fairing also uses a particularly light yet very rigid fairing front beam made of carbon fibre. Improved accessibility to the cable connections on the front indicator lights also ensures even faster dismantling to make the M RR "ready for track use" and thus for the race track.

With the new M RR, BMW Motorrad achieved a masterpiece of engineering in terms of aerodynamics. The seemingly mutually exclusive goals of "increasing top speed" and "increasing downforce" were not only reconciled in the M RR through the skilful overall development of all aerodynamically relevant components, but were also taken to a new level.

For example, the top speed of the M RR increased from 306 to 314 km/h compared to the previous model. Incidentally, the rider of the M RR also benefits from noticeable physical relief due to the greatly improved airflow.

In the course of this aerodynamic development, the M Winglets were also completely revised. In addition to achieving the highest possible maximum speed, which is essential for winning races, another goal is to achieve the best possible contact between the wheels and the road surface - especially when accelerating and cornering.

Wheelies are absolutely undesirable from a riding dynamics point of view, as the drive force in a wheelie is not converted 100 per cent into propulsion, but also to a considerable percentage into the

rising of the front end of the motorbike. Accordingly, the traction control kicks in to stop the wheelie and thus reduces the driving force. Valuable tenths of a second are lost here.

The M Winglets on the front fairing of the new M RR now produce significantly more aerodynamic downforce (+39%) - both when riding upright and when leaning in corners. The rider has even greater confidence now in the front wheel for achieving even more extreme lean angles or higher cornering speeds at the same lean angle as well as reduced wheelie tendency. At the same time, the rider benefits from a massively increased top speed.

Speed	M RR downforce up to now	Increase	M RR new downforce
150 km/h	4.1 kg	+ 1.6 kg	5.7 kg
200 km/h	7.2 kg	+ 2.8 kg	10.0 kg
250 km/h	11.3 kg	+ 4.3 kg	15.6 kg
300 km/h	16.3 kg	+ 6.3 kg	22.6 kg

Another central point in optimising the entire aerodynamics was the area of the front wheel. Here, for the first time in the history of BMW Motorrad, brake cooling air ducts made of visible carbon fibre are used - also referred to as brake ducts in short. They are integrated into the new front mudguards, which have been optimised for improved airflow around the fork legs and brake callipers, and reduce the temperature of the M brakes by up to 10 degrees Celsius in race track operation, helping them to achieve even higher performance and a more constant pressure point.

The M Aero Wheel Covers, also made of visible carbon fibre, lower riding resistance even further - especially at speeds above 250 km. The M Aero Wheel Covers are reserved for the M RR M Competition and include weight-optimised clamp feet with special connection for the M Aero Wheel Covers.

M Carbon wheels with new surface and M Design Tapes. Forged wheels optionally available ex works.

Carbon fibre - once developed for the aerospace industry, this high-strength and super-light material first established itself in racing and now also in BMW motorcycles. BMW Motorrad uses it wherever minimum weight and maximum rigidity are required.

The M Carbon wheels of the new M RR are an ideal area of application for this material, which is processed in a very elaborate process using high-pressure ovens - so-called autoclaves - because the advantages are obvious. Less weight means lower rotational masses leading not only to improved acceleration and braking behaviour but also makes the bike easier to handle.

In the new M RR, the M Carbon wheels stand out thanks to a new clear lacquer coat that brings out the high-quality, deep black shimmering carbon fibre structure even more intensively. New tapes in M design on the rims emphasise this high-grade, high-tech look as well as the racing claim of the new M RR. As an alternative to the M Carbon wheels, the new M RR can now also be ordered with forged wheels ex works.

Redesigned rear end, ergonomic M Endurance seat, short number plate holder and modified wiring harness.

A newly designed rear section with hump cover, rear and the rear sections above and below make the current M RR look even lighter, sportier and more dynamic. The short number plate holder and the ergonomically designed M Endurance seat are also new features. The special design of the seat contour provides the rider with a significantly larger contact area when hanging-off. The benefits are even better feedback and fatigue-free riding.

As before, the number plate holder and the indicator and number plate lights form one unit and the functions of the brake and tail lights are integrated into the side indicator lights. The extremely compact grouping makes it easy to get the M RR ready for track use in a few simple steps. Thanks to a modified wiring harness, which is now equipped with a so-called LWS connector in this area, disassembly is now even quicker and easier.

Uncompromising design and technology: The M RR featuring the M Competition Package.

If the M RR in standard trim is still not enough for you, the M Competition Package offers a fascinating mix of refined components for the racing technology gourmet and the aesthetically minded rider alike. In addition to the M GPS Laptrigger software and associated activation code, the M Competition package includes the M milled parts package, the M Carbon package as well as a natural-coloured anodised, 220 g lighter swinging arm, the DLC-coated M Endurance chain and the pillion package including hump cover.

Components of the M milled parts package are brake and clutch levers milled from high-strength aluminium and anodised, as well as a new, weight-optimised rider footrest system reduced to the essential functions and a brake lever guard. The M Carbon package includes covers for the rear wheel made of high-quality visible carbon and coated with clear lacquer, as well as the drive sprocket, a chain guard and the side and tank panels on the left and right.

3. Equipment program and customer sport concept.



Optional equipment and original BMW Motorrad accessories.

An extensive program of optional equipment and original BMW Motorrad accessories is available for customising the new M RR. Optional equipment items are supplied ex works and are integrated in the production process. Original BMW Accessories are installed by the BMW Motorrad dealer or by customers themselves. These items can also be retrofitted.

BMW Motorrad customer sport concept.

The new M RR is homologated in accordance with the FIM regulations for the FIM Superstock class as well as the FIM Superbike World Championship and will be manufactured in the minimum number of 500 units required for the World Championship and beyond. Within the price range specified by the regulations, the new M RR already has all the essential extras for motorsport homologation, which may not be subsequently modified.

This makes the M RR a highly effective basic motorbike for the Superstock and Superbike classes as well as for endurance races for numerous teams all over the world. For further performance-enhancing measures, the BMW Motorrad customer sport concept includes the following racing parts for the M RR:

- Kit motors (type 5 -7)
- Kit electronics (STK & SBK)
- Race exhaust system
- Tank-seat configuration
- Race body kit

Options.

• **M Competition Package:** In addition to the M milled parts package (Brake and clutch levers, rider footrest system, brake lever guard) and the M Carbon package (Visible carbon fibre covers for front and rear wheel as well as sprocket, chain guard, side and tank covers left/right), includes a swinging arm in silver anodised aluminium (-220 g), M GPS Laptrigger (activation code), M Endurance chain, pillion package, pillion seat cover.

• **Pillion package:** Pillion seat, pillion cover and pillion footrests.

Individual options.

- Pillion package with pillion seat cover.
- Theft alarm system.
- M GPS Laptrigger (vehicle software incl. activation code for operating the special accessory hardware).

Original BMW Motorrad accessories.

M Performance Parts.

- M GPS activation code.
- M GPS Datalogger including M GPS Laptrigger.
- M Endurance chain.
- M axle protectors.
- M Carbon airbox cover.
- M Carbon rear wheel.
- M Carbon front wheel.
- M Carbon chain guard.
- M Carbon rear wheel cover.
- M Carbon sprocket cover.
- M Carbon tank cover left/right.
- M Datalogger.
- M rider footrests.
- M rider footrest system.
- M seat.
- M seat high.
- M seat low.
- M pillion footrests left/right.
- M folding handbrake lever.
- M remote adjustment for brake.
- M handbrake lever protector.
- M chain tensioner.
- M folding clutch lever.
- M clutch lever protector.
- M mounting stand receptacle.
- M oil filler neck.
- M cover kit.
- M fork clamp for stub handlebars left/right.
- M forged wheel, rear.
- M forged wheel, front.
- M tyre warmers.

Ergonomics and comfort.

- Pillion seat.
- Windscreen tinted.
- Knee pads for tank.

Design.

- Tankpad.

Safety.

- Protective glass for 6.5 inch TFT display.

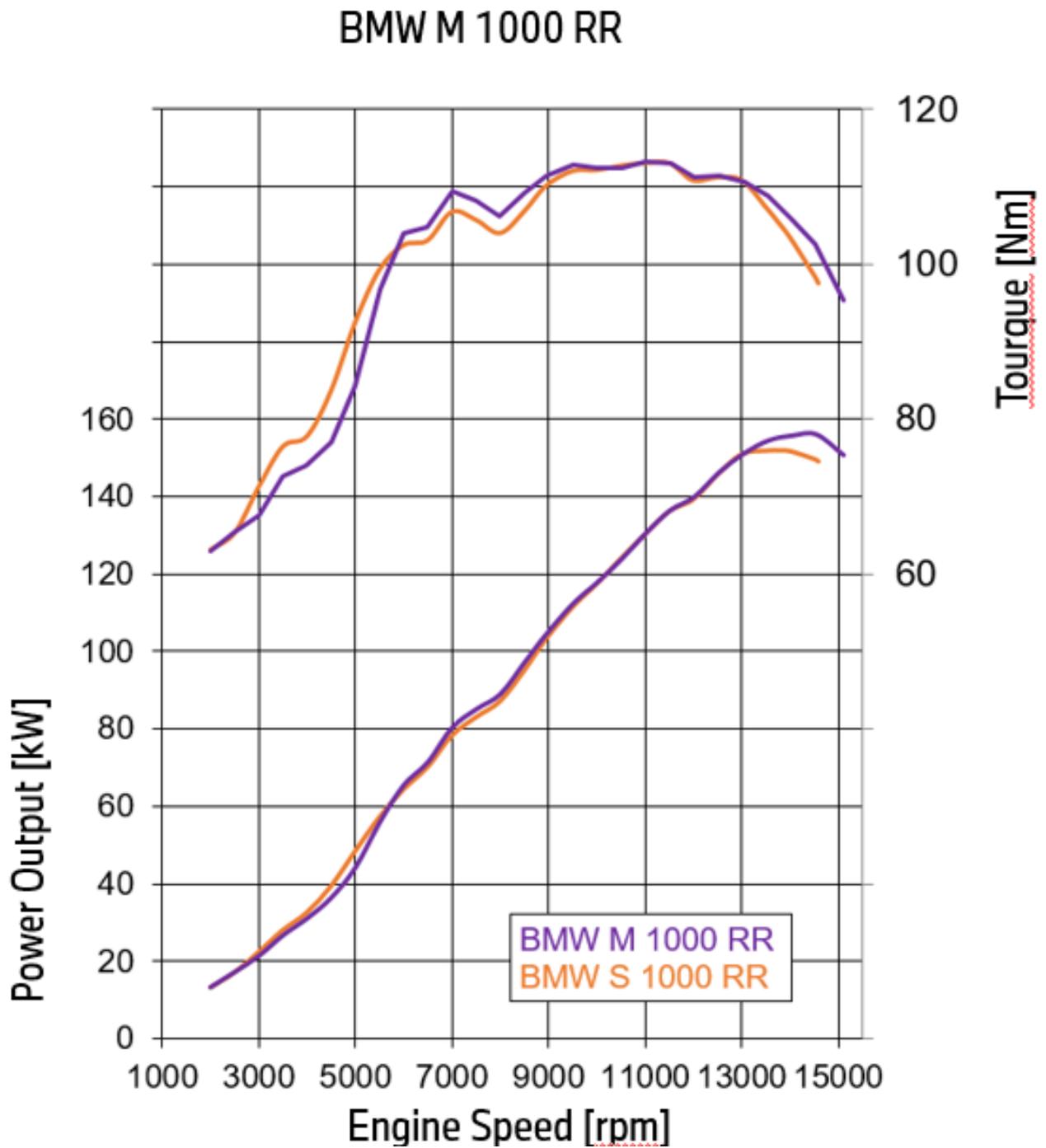
Storage.

- Rider equipment organiser

Maintenance and technology.

- Motorbike rug.
- BMW Motorrad Battery Charger Plus.
- Mounting stand Sport, rear.
- Mounting stand Sport, front.

4. Engine output and torque.



5. Technical specifications.



BMW M 1000 R		
Engine		
Capacity	cc	999
Bore/stroke	mm	80/49.7
Output	kW/hp	156/212
at engine speed	rpm	14,500
Torque	Nm	113
at engine speed	rpm	11,000
Type	Water-cooled in-line 4-cylinder engine	
Compression/fuel	13.5:1 / Premium unleaded petrol, octane rating 95-98 (RON) (knock control; rated power at 98 RON)	
Valve/accelerator actuation	DOHC (double overhead camshaft), Valve actuation via single cam followers and variable intake camshaft control system BMW ShiftCam	
Titanium valves per cylinder	4	
Ø intake/outlet	mm	33.5/27.2
Throttle valve diameter	mm	48
Engine control	BMS-O	
Emission control	Closed-loop three-way catalytic converter EU5	
Electrical system		
Alternator	W	450
Battery	V/Ah	Battery 12/5, maintenance-free
Headlamp	W	LED low beam twin headlamp in free-form technology LED high beam free-form surface/modular design
Starter	kW	0.8
Power transmission – gearbox		
Clutch	Multi-plate anti-hopping oil bath clutch, mechanically operated	
Gearbox	Constant-mesh 6-speed gearbox	
Primary ratio	1.652	
Transmission ratios	2.647	
	I	
	II	2.091
	III	1.727
	IV	1.500
	V	1.360
	VI	1.261
Rear wheel drive	Chain 17/46	
Secondary ratio	2.706	
Suspension		
Frame construction type	Aluminium composite bridge frame, engine self-supporting	

Front wheel suspension	Upside-down telescopic fork, slide tube diameter 45 mm, spring preload, compression and rebound stage adjustable,	
Rear wheel suspension	Aluminium underslung double-sided swinging arm with central spring strut, spring preload, adjustable compression and rebound stage,	
Spring travel, front/rear	mm	120/118
Wheel castor	mm	101,4
Wheelbase	mm	1,456
Steering head angle	°	66.4
Brakes	Front	Double disc brake, floating, Ø 320 mm, M brake radial four-piston fixed callipers
	Rear	Single-disc brake, Ø 220 mm, two-piston fixed caliper
ABS	BMW Motorrad Race ABS Pro (part-integral)	
Traction control	BMW Motorrad DTC	
Wheels	Standard: M Carbon wheels	
	Front	3.50 x 17"
	Rear	6.00 x 17"
Tyres	Front	120/70 ZR17
	Rear	200/55 ZR17
Dimensions and weights		
Total length	mm	2,085
Total width with mirrors	mm	899
Seat height	mm	832
DIN unladen weight, fully fuelled	kg	193
Permitted total weight	kg	407
Fuel tank capacity	l	16.5
Performance figures		
Fuel consumption (WMTC)	l/100 km	6.5
CO2	g/km	151
Acceleration 0-100 km/h	s	3.1
Top speed	km/h	314