BMW Motorrad at the INTERMOT 2008.
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1. The new BMW K 1300 S.
1.1 Overall Concept and Features.

The significantly updated and upgraded successor to the BMW K 1200 S is proudly celebrating its world debut at the 2008 INTERMOT motorcycle show: the new K 1300 S, the most powerful and fastest BMW the world has ever seen. As a milestone in the BMW Sports Encounter World and with engine output of 129 kW (175 hp) combined with overall weight of 254 kg (560 lb) including fuel, this truly supreme motorcycle offers the utmost in dynamic performance and sporting riding features.

Launching this new model, Europe's largest and most successful motorcycle manufacturer is once again increasing its leadership in the topmost class of sporting high-performance machines.

Even more sporting and dynamic.
Conceived consistently as a sports machine, the K 1300 S has not only maintained, but in many areas even enhanced the qualities of its predecessor. As a result, this new high-performer combines fascinating and innovative technology of the highest calibre with outstanding all-round qualities and safety. On the road this means even greater riding precision and agility, even more dynamic power and performance, and, at the same time, the superior safety and ease of control in all situations so typical of a BMW.

Like its predecessor, the K 1300 S does not make any compromises, but rather brings together even more consistently than before all the virtues of the most dynamic motorcycle in the K-Series: sporting and dynamic performance combined with superior comfort, playful and easy handling in combination with absolute riding stability, supreme top performance in conjunction with perfect everyday riding qualities, an even more slender and sporting look with optimised protection from wind and weather, plus sophisticated ergonomics.

Taking up a great tradition of BMW Motorrad, the new K 1300 S stands out through qualities typical of BMW such as a long service life, ease of maintenance, optimum emission management by means of a fully controlled three-way catalytic converter as well as maximum active safety when applying the brakes ensured through the most progressive brake system currently available in the market: BMW Motorrad Integral ABS featured as standard.

As in the past, BMW, through the K 1300 S, offers the only sports motorcycle in this segment with a maintenance-free drive shaft. Featuring innovative top-end technology, optimum riding qualities, an even more dynamic look and performance enhanced to an unprecedented standard, the K 1300 S impressively renders the BMW Sports Encounter World, clearly maintaining BMW's strong leadership in the upper sports segment.

Concept optimised in riding dynamics and technical features.
The main objective in developing the new K 1300 S was to create an even more supreme motorcycle with enhanced riding qualities ensured by an even more powerful and harmonious torque curve and a higher standard of riding comfort. Increasing engine capacity to 1,293 cc while maintaining maximum engine speed of 11,000 rpm ultimately led to a significant improvement of performance, power and torque.

In its fundamental qualities, the K 1300 S is based on the proven drivetrain configuration and engine arrangement of its predecessor, using the existing advantage of a low centre of gravity made possible by the extreme angle of the cylinder bank tilted 55° to the front and allowing very low arrangement of the engine. At the same time the new K 1300 S benefits from the very slender engine block allowing a very low angle in bends for a truly sporting and dynamic style of riding.

In its suspension and running gear the new K 1300 S – by far the lightest 1,300-cc model in this segment at 228 kg/503 lb dry weight – applies a successful concept combined with proven modules and components. One example in this context is the extra-low V-shaped radiator interacting with the wheel supports to provide an ideal configuration of the frame above the cylinder head and, as a result, reducing the overall width of the machine. And with the frame profiles merging smoothly at the rear, the K 1300 S enables the driver to hold his knees tightly together, ensuring optimum contact with the motorcycle under all conditions.

The active, dynamic and forward-looking seating position is tailored fully to the rider, but nevertheless allows a relaxed and comfortable style of motorcycling at all times. So while being unusually dynamic and sporting, the K 1300 S is almost playful and certainly very safe in its behaviour, guaranteeing stress-free riding pleasure even in sporting style.

Innovations on the running gear and electronics.
The upgraded front-wheel Duolever suspension makes a significant contribution to the outstanding riding qualities of the K 1300 S. The newly

developed, lower longitudinal arm now made of a forged aluminium alloy ensures an even more sensitive and transparent response, further enhancing the leadership of BMW Motorrad in the area of suspension technology.

The spring/damper set-up is firmer than before also in the interest of even better feedback.
The K 1300 S is available with second-generation Electronic Suspension Adjustment (ESA II) as an option, a further development and improvement of the original ESA suspension introduced for the first time in series production on the K 1200 S.

Applying the most advanced CAN-bus technology, the progressive on-board network allows a wide range of functions and facilitates the diagnostic procedures usually required by intelligently connecting the machine's electrical and electronic systems.

An overview of technical highlights:

- Even more dynamic performance, particularly at lower and medium engine speeds, thanks to the increase in engine capacity.
- Engine output 129 kW (175 hp) at 9,250 rpm, maximum torque 140 Newton-metres (103 lb-ft) at 8,250 rpm.
- Increase in torque by more than 10 Newton-metres (7.4 lb-ft) all the way from 2,000–8,000 rpm.
- Fulfilment of the strictest environmental standards through newly harmonised Digital Motor Electronics.
- Optimised cylinder charge cycle for even better performance on less fuel.
- Optimised exhaust system with a new rear muffler and electronically controlled flap management plus a fully controlled three-way catalytic converter.
- Desmodromic operation improving the dosage of gas and engine power.
- Optimised, maintenance-free shaft drive with a new, two-stage drive shaft.
- Even greater riding precision combined with maximum riding stability ensured by optimised Duolever front wheel suspension with new set-up of the lower longitudinal arm.

- Firmer spring/damper set-up for even better feedback.
- Supreme handling provided by optimised suspension geometry, optimum mass distribution and a fully harmonised all-round concept.
- Perfect balance thanks to the low centre of gravity.
- Ergonomically balanced seating position for a relaxed but active style of riding.
- Electronically adjustable second-generation ESA II suspension and ASC Anti-Spin Control as an option.
- New, innovative generation of switches with optimised ergonomics.
- High standard of active safety provided by integral ABS (semi-integral) featured as standard.
- On-board network; CAN-bus technology for superior function with a smaller number of cables and low weight.
- Electronic immobiliser featured as standard.
- Optimised aerodynamics.
- HP Gearshift Assistance for shifting up without the slightest interruption of power as special equipment.
- Wide range of standard features and special equipment tailored to the K 1300 S with the usual high standard offered by BMW.

1.2 Drivetrain.

The second generation of BMW Motorrad's four-cylinder power units has been upgraded and updated in the interest of even more power and performance, extra torque, and supreme riding dynamics. Displacement of the four-cylinder inline power unit in the K 1300 S is up by 136 cc from 1,157 cc to 1,293 cc. Maximum output is 129 kW (175 hp) at 9,250 rpm, maximum torque of 140 Newton-metres or 103 lb-ft comes at 8,250 rpm. In absolute figures, this is an increase in engine output by 6 kW (8 hp) and an increase in peak torque by 10 Newton-metres (7.4 lb-ft).

While the former K 1200 S had to be revved up to 10,250 rpm to develop its maximum output, the power unit of the new K 1300 S develops its maximum power at a relatively low 9,250 rpm.

A further sign ficant advantage is that more than 70 per cent of the engine's maximum torque is available from just 3,000 rpm, with 10 Newton-metres or 7.4 lb-ft more torque available all the way from 2,000–8,000 rpm versus the K 1200 S.

The objective in developing the new model was obviously to enhance the already high standard of riding dynamics and sporting characteristics through power and performance easy to handle at all times. And weighing 82.8 kilos/182.6 (K 1200 S: 81.3 kilos/179.3, in each case including the clutch, gearbox and oil), the upgraded power unit of the K 1300 S remains one of the lightest engines of its size in the market.

Like the previous model, the K 1300 S benefits above all from its carefully conceived overall configuration as well as the space-saving arrangement of ancillary units and the integrated gearbox. In all, this makes the entire drivetrain very compact, with ideal concentration of all masses in the middle of the machine. And as on the K 1200 S, the overall width of the power unit, measured on the level of the crankshaft, is 430 millimetres or 16.9".

The perfect interaction of technical solutions and optimum integration of the engine and running gear already featured on the K 1200 S is fully retained on the K 1300 S.

The engineers at BMW Motorrad have skilfully eliminated the disadvantage of a relatively high centre of gravity on the engine inevitable with a conventional four-cylinder concept in typical BMW style. Precisely for this purpose, therefore, the cylinder axis of the K 1300 S power unit, as on the former model, is inclined to the front at an angle of 55°. This not only lowers the centre of gravity, but also helps to ensure a well-balanced distribution of weight – an essential factor particularly for the sporting rider crucial to a precise feeling on the motorcycle and clear feedback.

A further advantage is that the spec fic angle chosen on the engine provides ample space for a free-flowing intake system directly above the engine and allows ideal configuration of the frame profiles according to the flow of power.

This upgraded, second generation of four-cylinder power units in the 85-year history of BMW Motorrad and the 25-year history of the K-Series fully reflects the traditional philosophy of BMW Motorrad to offer demanding, unique and, at the same time, highly superior solutions. As before, therefore, the engine concept boasted by the K 1300 S is acknowledged as the currently most advanced and consistent configuration in worldwide motorcycle construction.

Increase in capacity to 1,293 cc by enlarging the cylinder bore and extending engine stroke.
The crankshaft of the K 1300 S power unit, as before, is made of forged heat-treated steel and comes with eight counterweights as well as an offset angle of 180° traditional at BMW in order to ensure consistent firing intervals

Apart from the cylinder bore enlarged by 1.0 millimetres (0.39"), particularly the increase in cylinder stroke from 59.0 millimetres or 2.32" by 5.3 millimetres (0.21") to 64.3 millimetres (2.53") serves to increase engine capacity by 136 cc.

As before, the stroke/bore ratio of 64.3/80.0 millimetres (2.53/3.15") (K 1200 S: 59.0/79.0 mm; 2.32/3.11") ensures adequate bearing journal overlap in the interest of superior stiffness. Both the main and connecting rod journals measure 38 millimetres or 1.5" in diameter.

The lubrication system has been carried over from the K 1200 S, with the balance shaft bearings adapted to the new requirements of the K 1300 S.

The camshafts in the cylinder head are driven by a chain which, in turn, is driven by a sprocket forced-fitted on to the right end of the crankshaft.

In the process of upgrading the power unit of the K 1300 S, the engineers at BMW Motorrad have given particular emphasis to supreme riding qualities. Hence, the combustion chambers on the four-cylinder, the intake camshaft angle and the valve timing as well as the stroke of the outlet valves have been modified accordingly, with the outlet valve springs being re-set from the ground up.

Running in anti-friction bearings, the connecting rods are extra-light forged components made of heat-treated steel. Measuring 119 millimetres or 4.68" in length (K 1200 S: 120 mm/4.72"), they keep lateral forces acting on the pistons to a minimum and guarantee superior engine refinement despite the longer stroke.

Together with their anti-friction bearings, the conrods weigh just 404 grams (K 1200 S: 413 grams). In usual BMW style, the upper conrod opening comes with a bearing bush conceived for a service life of more than 100,000 kilometres or 61,000 miles.

The connecting rods are split horizontally in proven crack technology, with the large opening in the connecting rod being “broken” along its centre level by hydraulic force applied as an abrupt jolt. The fracture surface created in this way allows extremely precise subsequent assembly without requiring any further centring.

Newly developed lightweight box-type pistons measuring 80 millimetres or 3.15" in diameter, with a short piston apron and two slender piston rings optimised for minimum friction as well as a slender oil scraper ring, serve to increase cylinder stroke and, accordingly, the capacity of the engine.

The flat upper surface of the combustion chambers, the new contour along the bottom and the valve pockets all help to provide a stable thermodynamic combustion process. Through its new contour, the floor of the pistons serves additionally to optimise the weight of the entire unit: Together with the bolts and rings, piston weight is a mere 287 grams (K 1200 S: 299 grams).

To remove heat from the piston floor under high thermal load, the pistons are cooled at the bottom also on the K 1300 S by modified oil spray jets in the crankcase, helping to extend their service life.

The degree of crankshaft balance is adjusted to the different mass distribution through the use of new pistons. To eliminate free second-order mass forces inevitable on a straight-four power unit, the crankshaft, as on the former

model, drives two balance shafts positioned symmetrically in front of and behind the crankshaft via a gear drive, achieving a balance of no less than 86 per cent.

The balance shafts turn twice as fast as the crankshaft. To minimise any noise or sound waves generated in the process, the balance weights are connected to the balance shafts by means of elastomer units.

Extra-stiff cylinder/crankcase unit.
Split horizontally along the middle of the crankshaft, the cylinder crankcase is made of a high-strength aluminium alloy. Made of a die-casting, the compact upper section forms an extra-stiff composite unit comprising the four cylinders and the upper bearing support for the crankshaft. The cylinder block together with the coolant sleeve is an open-deck construction and the cylinder liners come with a wear-proof, low-friction nickel-silicon dispersion coating. Made as a pressure casting, the lower section forms the counterpart to the main bearing on the crankshaft and takes up the gearbox, holding it in position.

Cylinder head and valve drive upgraded to an even higher standard.
The power and performance qualities and characteristics, the quality of the combustion process and, accordingly, the fuel consumption of a power unit depend to a large extent on the cylinder head and valve drive. Hence, the four-valve cylinder head of the K 1300 S is designed for optimum duct and flow geometry, compact dimensions, optimum thermodynamics and a reliable thermal balance. The tight valve angle provides an ideal, straight intake duct and keeps the combustion chamber extra-compact for high compression and optimum efficiency.

Seeking to achieve optimum output and superior running stability also at high speeds, and at the same time ensuring superior stiffness, keeping all moving masses to a minimum and optimising the timing overlap on the valves, the K 1300 S, like its predecessor, the K 1200 S, comes with drag lever control on two overhead camshafts. This offers the perfect combination of maximum stiffness and minimum weight of all moving parts in the valve drive, at the same time keeping the cylinder head as compact as possible.

As on the former model, the valve angle is 10° on the intake and 11° on the exhaust side – figures unparalleled to this day by any other engine in this market segment.

Out of the two overhead camshafts, only the exhaust shaft is driven by a tooth chain from the crankshaft. The intake camshaft, in turn, is driven by a gear drive coming from the outlet shaft.

As a result, only one sprocket is required in the cylinder head, helping to ensure even more precise valve timing and keeping the cylinder head slender and compact.

Mod fied exhaust valve springs and an optimised tightening mechanism on the timing chain take the new exhaust valve timing of the K 1300 S and the requirements created in this way fully into account.

The camshafts are positioned directly above the valves, the geometric layout of the cylinder head ensured in this manner helping to give the drag arms the ideal transmission ratio of 1:1, meaning that they are subject to only minimum bending and flexing loads. As a result, the arms are extremely light and filigree in their design and construction.

The engine speed limit under regular running conditions is now 11,000 rpm although the engine would be able to run at far higher speeds in terms of mechanical engine loads as such. The diameter of the valve crowns, as on the K 1200 S, is 32 millimetres or 1.26" on the intake side and 27.5 or 1.08" on the exhaust side. In the interest of higher torque, the intake ducts are specially machined around the valve seat rings.

High compression for maximum efficiency.
The modified shape of the combustion chambers with their flat ceiling guarantees very high geometric compression with a thermodynamically favourable, largely flat piston floor on the K 1300 S. With its compression ratio of 13:1, the power unit of the K 1300 S again comes right at the top in the series production motorcycle market, offering an ideal combustion process and optimum efficiency.

Dry sump oil supply.
The K 1300 S features dry sump lubrication introduced on the K 1200 S and proven over many years – the same technology as is largely used on racing engines. Apart from superior operating qualities and reliability even under extreme conditions, dry sump technology quite unique in this segment keeps the crankcase low and flat and therefore ensures a low position of the engine and a low centre of gravity. By leaving out the usual oil sump, the entire engine may be fitted 60 millimetres or 2.36" lower down than a conventional power unit.

The oil reservoir comes in a tank fitted in the frame triangle behind the engine. A dual oil pump operating at the rear of the crankcase and driven by a chain from the clutch shaft draws in lubricant from the oil reservoir and feeds the compressed oil first to the oil filter (main flow filter). Easily and conveniently accessible from outside, the oil filter is positioned on the lower left side of the crankcase.

From there the compressed oil flows into the main oil pipe in the crankcase and is spread out through internal holes to the lubricating points. The oil flowing back, in turn, gathers at the lowest point in the crankcase formed by a bulge in the lower lid.

The second pump then delivers the oil flowing back first to the oil cooler and from there to the oil tank, forming a reflow system patented by BMW.

The larger oil cooler is integrated beneath the headlight in the aerodynamically optimised front fairing for superior aerodynamics. In the interest of consistent lightweight technology, finally, the oil cooler pipes are made of aluminium.

The oil level is checked conveniently and easily by means of a transparent plastic pipe at the outside of the oil reservoir. This patented hose-like pipe also serves to drain oil from the tank during maintenance. Capacity of the oil tank is 4.2 litres or 0.92 imp gals.

An oil level warner is available as an option in conjunction with the likewise optional on-board computer.

Perfect cooling concept for a good thermal balance.
The innovative but already proven cooling concept helps to give the power unit of a K 1300 S optimum thermal balance. The flow of coolant is spread out between the cylinder head and the cylinders by appropriately dimensioned pipes at a ratio of 73:27.

The coolant flows crosswise through the cylinder head, entering the hotter exhaust side when the it is at its lowest temperature. Precisely where the thermal load is most sign ficant, therefore, thorough cooling of the cylinder head helps to quickly dissipate heat and ensures an optimum temperature balance. The reduced flow of coolant through the cylinders helps to warm up the engine even more quickly and thus reduces cold running wear as well as friction, an advantage also in the interest of enhanced fuel economy.

The water pump fastened on the left side of the cylinder head is driven by the intake camshaft. This specific arrangement and the direct injection of coolant

into the cylinder head make the usual pipes superfluous, with all remaining hoses leading to the radiator being kept extremely short. And with the engine requiring only two litres of coolant, the entire structure again helps to save weight.

The patented radiator carried over from the K 1200 S is trapezoidal in shape and bent in its contours. Again helping to improve the centre of gravity, the radiator is fitted at the front of the motorcycle beneath the fairing. Through its high standard of efficiency and aerodynamic optimisation of the fairing and flow conditions, the radiator requires a relatively small surface of only 920 cm² to reliably dissipate heat under all conditions. A further advantage is that the integrated thermostat keeps the warm-up periods very short. And last but not least, the dirt protector fitted in front of the radiator is likewise optimised for perfect aerodynamics.

Optimum arrangement of all ancillary units.
To keep the engine as slender and compact as possible, the electrical ancillaries and their drive units are fitted behind the crankshaft in the open space above the gearbox. The alternator, in turn, is driven by the primary gear on the clutch, developing maximum output of 580 W and maximum electric power of 50 Amps. The pre-shaft starter is connected to the engine by a freewheel drive unit operating on the alternator drive gear.

Power transmission – reinforced multi-disc oil bath clutch, optimised cassette gearbox and HP Gearshift Assistant.
For the first time in the history of shaft-drive BMW motorcycles the predecessor to the K 1300 S, the K 1200 S, came with a multi-plate oil bath clutch with friction plates measuring 151 mm/5.94" in diameter as well as a gearbox integrated in the engine housing by angular drive.

Given the compact dimensions and the concentration of masses ensured in this way, this configuration continues to offer sign ficant benefits and is therefore also featured in the new K 1300 S. The clutch has however been upgraded through optimised linings and mod fied plate operating springs to the higher power and torque of the engine. At the same time dosage of the clutch, the operating force required and the engagement travel of the clutch have also been optimised by increasing the size of the slave cylinder from 32 to 34 millimetres (1.26 to 1.34").

In designing and laying out the gearbox at the time, BMW did not take the usual approach. Instead, the gearbox was conceived as a separate unit for subsequent installation, a so-called cassette gearbox. This concept comes straight from motorsport, where it allows parts to be exchanged quickly

and easily and where individual gears with different ratios may also be interchanged as required. In series production, on the other hand, this concept provides the option to pre-assemble the entire gearbox as one unit, offering advantages in the assembly process.

The dog-shift two-shaft gearbox is slender in design and extra-light. The gears are shifted by a shift cylinder, shift forks and sliding wheels to create a positive engagement.

The gearbox has been upgraded and mod fied for the new K 1300 S, with the shift forks, the shape of the dog-shift units and the geometry of the gears themselves being optimised in the process. The gears are now contoured differently at the rear and the shift forks come with a three-point rest replacing the former two-point base.

To reduce weight the hollow shift cylinder is made of high-strength aluminium alloy and runs in anti-friction bearings. The shift forks are made of steel and are lubricated by compressed oil. To reduce the length of the gearbox, the two gearbox shafts are positioned above one another. The gears themselves are in straight-tooth configuration benefiting not only the degree of efficiency but also the overall width of the gearbox.

The K 1300 S features a new shift lever with an ergonomically optimised pivot point. Together with the likewise new anti-friction bearing for the shift lever this ensures an even more precise and faster gearshift than before. At the same time gearshift travel is even shorter and more dynamic.

For the first time in the history of large-scale motorcycle production by BMW and, indeed, for the first time in series production worldwide, the rider of the K 1300 S is able to shift up with the help of the optional HP Gearshift Assistant without operating the clutch and, accordingly, without the slightest interruption of traction and pulling force. To perform this operation the ignition and fuel supply are interrupted for fractions of a second in the shift process.

The HP Gearshift Assistant introduced for the first time on the HP2 Sport comes together with the sports footrests available as special equipment.

Shaft drive to the rear wheel – optimised and quite unique in the sports segment.
As on all large-capacity BMW motorcycles, the rear wheel is driven by a drive shaft also on the K 1300 S. And since the engine is fitted crosswise, the shaft comes on two pivots.

The final drive comes with gears adapted to the higher torque of the engine as well as optimised bearings.

The loss of efficiency resulting from two joints in the drive shaft is often overestimated and in reality amounts to only a few per cent. Studies show that as of a certain degree of wear and a certain amount of dirt on the surface, chain drive develops sign ficantly greater friction reducing the efficiency of the drive system accordingly, whereas a drive shaft operates free of wear and maintains its high level of efficiency throughout its entire lifecycle.

The K 1300 S meets the greater demands in terms of power, performance and torque through a new two-stage shaft configuration which also has a positive effect on the shift qualities of the gearbox.

The entire rear-wheel drive system is described in detail in the section on the suspension and the Paralever.

Newly set-up engine management with cylinder-specific knock control.
The K 1300 S comes with the most advanced DME Digital Motor Electronics currently available on a motorcycle. This electronic management system referred to as BMS-K (BMW engine management with knock control) is an in-house development by BMW Motorrad specifically for the motorcycle and was already featured on the K 1200 S. The most significant highlights of this management concept are fully sequential, cylinder-specific fuel injection, integrated knock control, rapid processing of a wide range of sensor signals through the most advanced micro-electronics, a compact layout, low weight and self-diagnosis.

Reflecting the increase in engine capacity and power, BMS-K has been newly set up on the K 1300 S. This ensures even more spontaneous behaviour under part load while the engine responds even more homogeneously and softer to the accelerator lever at all engine speeds and loads.

Use of the latest D4 CVE for the Central Vehicle Electronics as management and control software makes the system future-proof in every respect.

Torque-based engine management with Alpha-n-control.
The K 1300 S features the same torque-based engine management concept taking a wide range of parameters into account as already used on the K 1200 S. As an example, the engine management system ensures a smooth and balanced transition of torque and a sensitive response of the engine to all kinds of running conditions.

The principle of Alpha-n management with indirect control and monitoring of the air drawn in via the throttle butterflies at a specific angle and engine speed has been upgraded to provide the new concept of torque-based engine management. The engine operating point is based in all cases on engine speed and the angle of the throttle butterfly determined by a potentiometer. Then, taking additional engine and ambient parameters into account (including the engine temperature, air temperature, ambient air pressure), the engine management system, interacting with control maps installed in advance as well as specific correctional functions, determines the appropriate injection volume and ignition timing required.

Fuel injection is fully sequential, with fuel being injected into the intake ducts exactly in line with the intake stroke of the respective cylinder.

Optimum supply of fuel ensured by variable pressure control.
The fuel supply system does not require a reflow pipe or any other kind of similar facility, but rather, thanks to variable pressure control, delivers exactly as much fuel as the engine genuinely requires. Thanks to this fuel volume control, fuel supply pressure may be varied almost at random in the interest of optimum fuel/mixture formation. The fuel fed to the engine is controlled by appropriate operation of the fuel pump, while the fuel/air mixture is masterminded by an oxygen sensor located where the four exhaust manifolds come together and precisely determining the composition of exhaust emissions.

Supreme environmental compatibility, optimised response and even more precise dosage of the gas lever.
The BMS-K control unit integrates the automatic idle speed control and the cold start enrichment functions also on the K 1300 S. Idle speed is automatically raised to a higher level when required in the engine warm-up phase and is controlled by a so-called “idle stepper” (fully controlled bypass ducts for additional air) integrated in the airbox and the appropriate injection of fuel. The entire idle system has been set up anew on the K 1300 S.

The throttle butterflies on the K 1300 S measuring 46 millimetres or 1.81" in diameter come with a new, desmodromic operating system, each with an opening and closing cable, again in the interest of even more precise gas dosage.

As an additional feature, the position of the butterflies predetermined by the gas lever is precisely controlled and maintained by a step motor serving to optimise engine response and gas dosage to an even higher standard.

With various functions being integrated and combined with one another, the entire fuel supply system is extremely light. The three-piece injection rail is made of plastic and comprises the fuel pressure sensor. The rod-shaped high-energy ignition coils housed in the cylinder head, finally, help to make the engine management system even more efficient.

High compression and knock control for enhanced fuel efficiency.
Fuel consumption of the K 1300 S at 90 km/h or 56 mph is 4.7 litres/100 km, equal to 60.1 mpg imp, and increases at 120 km/h (75 mph) to 5.3 litres (equal to 53.3 mpg imp) of premium plus. Considering the significant increase in power and performance, this again sets a new record in the sports motorcycle market. To a large extent this improvement is attributable to the very high geometric compression ratio only possible with anti-knock control.

On the anti-knock control system two body sound sensors positioned between cylinders 1 and 2 and, respectively, 3 and 4 determine even the slightest knocking phenomena in the combustion process. The electronic engine control unit will then respond immediately by taking back the ignition angle (retarding the ignition), thus protecting the engine from possible damage.

Conceived under regular conditions for unleaded premium plus (RON 98), the engine, thanks to knock control, may also run on RON 95 premium without any risk of damage and without requiring any manual intervention on the part of the rider. Should the quality of fuel drop to an even lower level, however, the engine will lose some of its peak power and fuel consumption will increase accordingly.

The intake system – optimised air supply for an optimum cylinder charge.
With the engine being tilted to a low angle, an airbox fits perfectly directly above the engine. The four intake manifolds then lead directly and without the slightest curvature into the airbox which, with its capacity of 10 litres, makes yet a further contribution to the muscular power and high torque of the K 1300 S.

The two funnels extending out straight to the front with perfect aerodynamics thanks to the appropriate position of the airbox have been optimised for even better and smoother flow conditions. They draw in air from right and left beneath the headlight in the ram pressure section of the fairing even more efficiently than before, the ram air effect generated in this process enhancing the degree of cylinder charge at high speeds on the road.

In the process the intake air flows past two separate paper air filters newly developed for the K 1300 S and merging at the end of the funnels just where they lead into the airbox. To ensure simple and straightforward service, the paper air filters are easy to reach after removing the side panels on the fairing.

Apart from the modern cyclone oil separator serving to purge the engine, the airbox also contains the newly configured idle system. In order to save weight and space through the integration of functions, the airbox finally also serves to hold the battery in position.

New exhaust system – three-way catalyst for optimum emission control, exhaust butterfly for extra torque and a sporting sound.
On the revised exhaust system of the K 1300 S the four individual manifolds of exactly the same length merge initially into two pipes beneath the gearbox and then into one single pipe leading on into an extra-large, newly developed rear muffler (4-in-2-in-1 principle).

The muffler sign ficantly shorter than on the former model and now finished in sporting hexagonal design offers a capacity of 9.1 litres (K 1200 S: 9.5 litres) despite its short length and works according to the reflection principle. Both the outer skin and the all-new interior of the rear muffler now much lighter than before are made of top-quality stainless steel.

The metal-based catalytic converter with 200 cells/square inch is integrated exactly at the point where the manifold merges into the rear muffler and comes with a coating of rhodium and palladium combining superior temperature resistance with a long service life.

Full maintenance of the strictest noise and emission limits, despite the increase in engine power and performance, is ensured on the K 1300 S for the first time at BMW by a butterfly in the collector pipe electronically controlled and opening up the full cross-section of the exhaust manifold as a function of increasing engine speed. At low to medium engine speeds the variable cross-section remains relatively small to build up greater ram pressure in the interest of extra torque and pulling force, while the full cross-section opened up at higher engine speeds serves to develop maximum power and a sporting sound.

Apart from making an important contribution to the even more muscular torque curve and improving the motorcycle's riding characteristics in the process, the new muffler offers a powerful sound pattern full of character but

nevertheless in full conformity with legal standards. And last but certainly not least, the hexagonal shape of the muffler allows the rider to lean over to a low angle in bends for a sporting style of riding pleasure.

The entire muffler system made of stainless steel weighs a mere 9.4 kilos/20.7 lb (K 1200 S: 10.4 kilos/22.9 lb) and is therefore the lightest and most compact exhaust system with a fully controlled catalytic converter in this segment of the market. All other manufacturers require an exhaust system with two mufflers.

The K 1300 S is also available with a very light and sporting slip-on muffler made of titanium and featuring a carbon cover as special equipment from Akrapović®.

ASC for even greater safety when accelerating.
The K 1300 S comes as an option with ASC Anti-Spin Control fitted at the factory and taking the significantly greater power and torque of the new four-cylinder into account.

Particularly on a high-torque motorcycle and on road surfaces varying frequently, ASC is a very sensible addition to ABS, preventing the rear wheel from spinning when accelerating and thus losing lateral stability, which otherwise might make the rear end swerve out of control.

By comparing the speed of the front and rear wheels with the help of the ABS sensors, the electronic control unit determines when the rear wheel is spinning, engine management taking back the ignition angle and intervening in the fuel injection process to reduce engine power accordingly.

The particularly sporting rider also has the option to deactivate ASC while riding and is also able to switch off ABS as long as the motorcycle is at a standstill before setting out.

1.3 Suspension and Running Gear.

Innovative suspension technology with optimised suspension geometry, springs and dampers.
The suspension geometry of the new K 1300 S has been upgraded in the interest of even more neutral behaviour in bends and an even higher standard of agility. This is achieved by modifying the wheel carrier in its production process and by the use of a Duolever with a newly designed lower longitudinal arm.

With the K 1200 S entering the market in 2004 as the world's first production motorcycle to feature ESA Electronic Suspension Adjustment, the new K 1300 S now goes a step further four years later: As before the springs and dampers may be adjusted electronically at the touch of a button – but now the spring rate may also be modified by the rider.

The front wheel suspension again features the Duolever launched in 2004 as another world-first achievement, the lower longitudinal arm formerly made of forged steel being replaced on the K 1300 S by a new longitudinal arm made of forged light alloy. This reduces unsprung masses by approximately 1 kg in the interest of an even more sensitive and transparent response and steering behaviour of the Duolever kinematics.

The rear wheel suspension uses BMW Motorrad's proven lightweight Paralever, the modified and now even firmer set-up of the rear spring strut taking the sporting and dynamic character of the K 1300 S into account. Together with the rider's seating position, appropriate interaction of the suspension and the position of the engine ensures not only a low overall centre of gravity with ideal mass concentration on the new K 1300 S, but also perfectly balanced, ideal wheel load distribution of 50:50.

As on the former model, the central load-bearing component is the main frame in bridge configuration. In this case the frame is a welded combination of internal high-pressure moulded elements (IHM profiles) for the bent profile units at the side and extrusion-pressed profiles together with die-cast components for the frame head and the lower section of the swing arm bearings.

A high-precision welding robot subsequently assembles the components in the in-house Aluminium Competence Centre at the BMW's Berlin Motorcycle Plant to form an extra-stiff overall frame. And with the engine being tilted to an extreme angle, the profile bars of the main frame run above the cylinder head, unaffected by its width. This allows ideal configuration of the frame, which can be kept slim and slender as a result.

This superior configuration is also supported around the swing bearing by the Paralever allowing the footrests to be positioned low down while nevertheless enabling the rider to lean the motorcycle over in a bend by more than 50° (measured geometrically) thanks to the overall configuration of the suspension and power unit.

Together with the Duolever front-wheel suspension, the low configuration of the frame ensures a very good flow of power and, accordingly, keeps the forces acting on the frame structure to a minimum. Overall weight of the main frame is a mere 11.5 kg or 25.4 lb.

The power unit is bolted firmly to the frame at six points and acts as a stiffening unit without performing any load-bearing functions. The light rear frame is made of square aluminium profiles welded to one another and is bolted on to the main frame at four points.

Reflecting the true style of a genuine sports machine, the K 1300 S comes in regular trim with only one side-stand. A main stand is however available as special equipment and may be retrofitted within a matter of minutes.

The BMW Duolever – perfect front-wheel suspension.
The Duolever ensures superior riding precision and directional stability, together with superior suspension comfort and clear feedback. It offers even the sporting and ambitious rider an unparalleled feeling of safety in every situation.

The front-wheel suspension is indeed the elementary component of a motorcycle in terms of riding precision and comfort. Realising this fact at a very early point in time, BMW has indeed introduced a series of innovations on the front-wheel suspension throughout the 85-year history of the Company.

The first hydraulically dampened telescopic fork on a production motorcycle (1937), the longitudinal swing arm ('50s and '60s), long-stroke comfort telescopic forks ('70s) and the Telelever (1993) were and still are milestones in motorcycle technology invented or at least enhanced by BMW Motorrad and introduced by BMW for the first time in series production.

Prior to the launch of the K 1200 S in 2004 the Telelever was the only front-wheel suspension system able to achieve genuine success in the market next to the telescopic fork still playing a dominating role at the time. And this is no surprise, considering that the Telelever offers superior functions and comfort features and is the optimum solution for BMW's range of Boxer motorcycles.

The K 1300 S, like its predecessor, now offers an even better solution for a sports motorcycle with perfect kinematics – the Duolever. In this case a square configuration of arms made up of two almost parallel longitudinal struts able to swivel within the frame support the wheel bearing and allow the wheel to move up and down in a steady stroke wherever required.

The wheel bearing newly finished for the K 1300 S as an extra-light and high-strength aluminium alloy casting is connected to the longitudinal arms by two ball joints and is therefore able to perform an appropriate steering function.

The steering axis is the straight line between the two ball joints, steering movements being transmitted and the entire system being separated from the wheel moving up and down by a scissor-like bar assembly. The handlebar, finally, rests in conventional configuration in the frame head turning as desired in the appropriate direction.

A central spring strut pivoting on the lower longitudinal arm provides the spring and damping action required to give the K 1300 S an even firmer set-up for enhanced feedback to the rider. The geometry of the two longitudinal arms allows the wheels to perform virtually ideal movements, as required in a given situation. The wheel is able to move up and down on account of the kinematic configuration of the overall system in an almost straight trajectory minimising any change in castor and wheelbase as a function of spring travel.

The wheel movement curve is slightly inclined to the rear allowing the wheel to follow bumps on the road in a natural motion in the inbound and rebound process, avoiding and setting off the impact of bumps on the road surface.

In combination with the low-friction rotational movement of the longitudinal arms, spring action thus always remains smooth and supple even under high lateral forces or impacts. This allowed the engineers at BMW Motorrad to choose a firm set-up without making any noticeable concessions in terms of riding comfort, thus achieving the optimum result for a sports motorcycle. And with wheel forces resting on the longitudinal arm positioned far down

(with short leverage to the wheel/road contact point), forces and momenta are fed into the frame in a smooth process, again reducing any loads acting on the frame structure.

The front-wheel suspension combines supreme stiffness with minimum weight, since the design and configuration of the wheel carrier may be freely chosen also in its contours due to the cast structure and may therefore be adapted precisely to the force curves. Appropriate wall thickness determined spec fically according to local load conditions reduces the weight of the frame without forfeiting any strength or stiffness. And taking the main direction of forces into account, the longitudinal arms are set up mainly to absorb forces in their longitudinal direction, that is inbound and rebound forces, a structure which again makes them particularly stiff.

The lower longitudinal arm previously made of forged steel is replaced by a light-alloy forging on the K 1300 S. Through its light but nevertheless extremely stiff configuration, this new arm guarantees an even more sensible and transparent response, at the same time reducing unsprung masses by approximately 1 kg. Hence, the overall structure weighs a mere 12.7 kg/28.0 lb, as opposed to 13.7 kg or 30.2 lb on the K 1200 S.

The geometry of the spring strut pivot point follows a slight progression, with 115 mm or 4.52" of spring travel (60 mm/2.36" inbound, 55 mm/2.16" rebound). At 32° right and left, steering lock complies with the usual standard in this class.

A new feature is the upper fork bridge on the new K 1300 S which, through its open design, helps to save weight and gives even greater emphasis to the sporting and dynamic character of BMW's new high-performance machine.

Through its kinematic behaviour, the Duolever also serves to set off brake dive, which remains virtually unchanged throughout the motorcycle's complete range of spring travel. Longitudinal forces acting on the front wheel when applying the brakes cause hardly any inbound spring action, only the dynamic distribution of wheel loads leading to a certain dive effect giving the rider through the telescopic fork the usual feedback on how hard he is applying the brakes. Hence, the Duolever combines the feedback from the front wheel so important to the sports rider with the comfort and safety benefits of an anti-dive set-up.

Paralever swing arm and optimised lightweight drive shaft.
Shaft drive is indispensable for a BMW motorcycle with its large engine – not just for reasons of tradition, but primarily because of the well-known functional benefits of a drive shaft.

The challenge in developing the drive shaft this time was to minimise the greater unsprung masses versus chain drive to such an extent that the rider would not even feel the difference.

An advantage was that the light and stiff drive shaft unit with its Paralever swing arm featured for the time in the R 1200 GS in early 2004 and then again in the K 1200 S, is ideally suited as a lightweight construction for the K 1300 S.

The Paralever swing arm made of a high-strength cast aluminium alloy was redesigned for the K 1300 S in order to make allowance for the change in dimensions resulting from the upgraded ESA II electronic suspension around the rear spring strut.

As before, the swing arm is particularly light since, in its design and dimensions, it follows precisely the defined loads also on the K 1300 S. Despite its low weight, the swing arm is stiffer than most conventional swing arm constructions. Geometrically, it is set up for 90 per cent anti-dive, the swing arm pivot point beneath the front universal joint on the drive shaft helping to make the swing arm mount appropriately slender and allowing installation of the footrests at a lower point.

The swing arm mount itself is positioned on the stiff main frame made up at this point of a highly stable cast light-alloy structure. Forces acting on the final drive housing are guided above the swing arm, providing space for fitting the brake calliper below. The advantages, again, are a better thermal balance and easier removal of the wheel whenever necessary.

The pivot point for the final drive housing in the swing arm is beneath the drive shaft axis, the overall system made up of six pivot points being set up kinematically to avoid any effective changes in length on the drivetrain throughout the entire range of spring travel. Hence, there is no need for additional length and tolerance compensation.

On the K 1300 S the spring strut comes with even firmer suspension and damping to provide even better feedback. Accordingly, the strut pivots via a lever building up approximately 30 per cent progression near the pivot point,

and resting via a boom arm on the main frame. This progression ensures a sensitive response of the suspension together with improved traction while nevertheless offering sufficient reserves for riding with a passenger.

The final drive housing is tailored to the inner contour of the angle drive, avoiding even the slightest waste of space. And being calculated with utmost precision, the crown wheel, finally, is very light in order to save additional weight.

To meet the greater demands for power and torque, the new K 1300 S comes with a newly developed two-stage drive shaft also offering advantages in the use and operation of the gearshift, as well as a final drive unit with a larger module.

For reasons of weight, the wheel flange is made of aluminium. Through its larger diameter, the flange gives the wheel perfect support, again allowing weight to be saved around the hub of the rear wheel. The optical highlight of this compact and elegant lightweight structure is of course the 50-millimetre hole drilled into the axle shaft and axle drive housing which, through its large surface and flow effects, enhances the removal and dissipation of heat from the final drive.

Electronically adjustable ESA II suspension – now adjustable at the touch of a button not only for spring and damper action, but also in its spring rate.
Suspension is provided front and rear by extra-firm gas-pressure spring struts on the K 1300 S. Spring travel is 115 millimetres or 4.52" up front and 135 millimetres or 5.31" at the rear.

In standard trim the rear spring strut allows infinite adjustment of damping forces in the rebound mode. And to adjust to various loads and forces, the spring base may be varied by a hand wheel infinitely over a range of 10 millimetres or 0.39".

As an option at extra cost the rider of the new K 1300 S may adjust not only damping on the front and rear spring strut as well as the spring base (spring pre-tension) of the rear spring strut, but now also the spring rate at the rear and, accordingly, the “hardness” of the spring – and all this conveniently at the touch of a button.

This is done by ESA II Electronic Suspension Adjustment setting the suspension most conveniently and more precisely than ever before to the rider's particular preferences and the load the motorcycle is carrying. The result is a new dimension of riding stability and excellent response under all riding and load conditions.

ESA II is the world's first system for electronic suspension adjustment on a motorcycle offering such a wide range of adjustment options: The rider is able to adjust both the spring base and the spring rate as well as the damper inbound and rebound motion on the rear wheel. On the front wheel, in turn, adjustment is limited to rebound damping.

To make this control function as simple and straightforward as possible and to avoid false settings, the rider only has to enter the current load condition ("solo", "solo with luggage" and "with passenger and luggage".) Adjustment of the appropriate spring base and spring rate is then automatic, with the system adjusting the individual values to one another.

Depending on his style of riding, the rider may also choose the Comfort, Normal or Sports mode, electronic management then applying this data to determine the appropriate damping rates in accordance with the optimum parameters saved in the Central Vehicle Electronics (CVE) and applying these parameters accordingly.

In all, this allows no less than nine different adjustment variants on the new K 1300 S.

Thanks to this additional adjustment of the spring rate, the ride height of the motorcycle may be adjusted perfectly to various load conditions, ensuring an even higher standard of riding stability, handling and comfort at all times. Even under high load, therefore, this maintains the rider's full freedom in leaning over to a low angle in bends and thus allows a sporting style of riding. And last but not least, adjustment of the spring rate dramatically reduces the risk of the springs sagging and giving way.

The rider is even able to change the current damper setting (Normal, Sports, Comfort) while on the road, again at the simple touch of a button. For reasons of function and safety, on the other hand, the spring base may only be changed when the motorcycle is at a standstill. While the damper rate is modified by small step motors on the damper itself, the spring base is adjusted by an electric motor together with a special transmission.

The spring rate and its control map are modified by a plastic element (Elastogran) which, in combination with a conventional coil spring, takes up forces in the inbound stroke. During the inbound stroke motion the deflection of this element to the side is limited, depending on the setting chosen, by a sleeve pushed into position with the help of a step motor acting like a stronger and firmer spring.

This almost completely eliminates any sagging motion of the rear end in the inbound stroke and any change in suspension geometry otherwise caused in this way. So with the rider adopting the same style and riding in the same style, the K 1300 S is just as stable on the road when carrying its full load as it is when the rider is riding solo.

Should the rider change the damper rate by pressing the button while riding, ESA II will adjust the spring rate accordingly, again maintaining the normal dynamic set-up of the suspension in virtually every situation. This is made possible by a particularly powerful step motor in a position to vary spring rate also under load. Accordingly, the appropriate spring rate is maintained under all conditions with every damper setting chosen.

In the Sports setting the normal set-up of the machine is modified for even better handling and the rear end of the motorcycle is raised up. This shortens wheel castor, which remains at the same consistently higher standard regardless of the load the motorcycle is carrying.

Wheel load at the front, in turn, remains consistent, depending on the spring rate chosen in advance. This ensures the same level of riding and brake stability as well as superior steering precision at all times.

Additional adjustment of the spring rate provided by ESA II makes it possible to increase the spread of settings in the Sports, Normal and Comfort programs versus ESA I, the rider thus benefiting from an ever wider range of adjustment options on the road. In other words, the Sports mode offers even greater dynamics and precision, the Comfort mode ensures an even higher standard of comfort together with excellent stability.

Wheels and tyres – extra stable lightweight wheels, rear tyre in new dimensions.
The light-alloy cast wheels on the K 1300 S are already well-known from the K 1200 S. The particular shape and design of the wheel spokes were determined by means of an innovative, bionic calculation model, a type of calculation based on the building principles and structure we see in nature. In this process, proceeding from load data and tightening conditions on the

fastening points, the optimum design and shape of the components is calculated step-by-step. Indeed, even the looks of the motorcycle benefit from this method, with both the front and rear wheel looking light, filigree and dynamic.

While similar in their looks, the wheels differ in their construction and method of production: On the front wheel the brake discs are connected directly to a stable wheel star without any carrier elements. These five radial arms extending out of the hub split up and support the wheel rim equally and consistently by ten cast spokes. The fork arrangement is tangential, with radial spokes giving the front wheel excellent radial stability and taking up a high wheel load. At the same time the front wheel takes up the main load exerted by high circumferential forces (when applying the brakes).

This special wheel design and configuration ideal for taking up even heavy loads helps to keep the spoke structure particularly stylish and even filigree in its finish, serving not only to minimise weight, but also to create a particularly light and even transparent look.

On the rear wheel the rim is likewise supported by ten spoke arms with similar orientation. These spokes are not split up into individual sections, but rather extend all the way to the wheel hub itself. The brake disc, in turn, is bolted on to the wheel flange.

Dirty fingers and tedious groping around in checking tyre pressure is now a thing of the past, since the tyre valve is integrated in one of the spokes at the side, allowing convenient access in virtually all positions of the wheel.

Wheel dimensions are 3.5" x 17 at the front and 6.0" x 17 at the rear. While on the new K 1300 S the front tyre, as on the former model, measures 120/70-ZR17, the rear tyre formerly measuring 190/50-ZR17 is now being replaced by a 190/55-ZR17 tyre in the interest of even more harmonious riding behaviour.

EVO brake system and BMW Motorrad Integral ABS both featured as standard.

The K 1300 S features the EVO brake system already well-known from the previous model and proven in the market everywhere, that is the same superior system also featured in BMW Motorrad's other Boxer and K-Series models.

The brake lines on the EVO brake system are clad in steel for extra protection, brake discs measuring 320 millimetres or 12.6" up front and 265 millimetres or 10.4" at the rear ensuring maximum stopping power also from very high speeds and under high loads.

The EVO brake system has proven its additional qualities such as the extremely fast build-up of brake pressure and minimum operating forces even when applying the brakes all-out in many tests.

Given all these qualities, the EVO brake system from BMW – EVO stands for evolution – is already acknowledged in the market as one of the safest and most effective brake systems available.

The EVO brake system is featured as standard also on the new K 1300 S together with BMW Integral ABS likewise well-known from BMW's other models, in this case in the particularly sporting and dynamic semi-integral variant. "Semi-integral" means that when pulling the handbrake lever both brakes (on the front and rear wheel) are activated while the footbrake lever acts only on the rear-wheel brake.

Integral ABS was already adapted to the sporting configuration and style of the K 1200 S and has now been enhanced further in its control features.

Since the sports rider wants to be able to dose the brakes smoothly and consistently with precise feeling, specifically this requirement has been taken into account, ensuring that even when applying the brakes all-out on the K 1300 S there is virtually no risk of the motorcycle toppling over – also thanks to the low centre of gravity and the particular geometry of the suspension interacting with the kinematic configuration of the Duolever.

In other words, the rider is able to make full use of maximum tyre grip also in the ABS brake mode, enjoying maximum safety even in an extreme braking manoeuvre.

1.4 Electrics and Electronics.

New generation of switches, modified instruments, LED rear lights and HP instrument cluster as special equipment.

New electrical switch units.
The K 1300 S boasts a brand-new generation of switches and manual controls also to be introduced on all upcoming BMW motorcycles. Using MID (Moulded Interconnect Devices) technology, the new switch units are far smaller and more compact and stand out through an even higher level of functional convenience, clear design and optimum accessibility.

The formerly separated functions for the direction indicator lights left and right are now grouped in one and the same function on the left-hand side of the handlebar to avoid any confusion of the direction indicators and the horn. And as a further change, the hazard warning flashers are now operated by a separate switch within easy and convenient reach on the left-hand handlebar control. The functions for the low and high beam as well as the lights flasher are all combined in one switch easy to reach with your left index finger.

To ensure even easier and more convenient operation, the knob for the handlebar heating has been moved up. And in accordance with practical requirements, the functions for the starter and kill switch are combined in one toggle switch unit, ensuring that even with inadvertent operation of the kill switch the starter with the ignition interrupted cannot be operated by mistake and subsequently empty the battery.

Operation of the ESA II and ASC systems formerly controlled by two separate switches is now also combined in one toggle switch.

Given this new technical configuration, the rider is able to operate twice as many functions as before with the same number of switches. This is an important factor in handling future equipment not yet known today, let alone fitted on the machine.

To begin with, the switch operating the heated handles on the K 1300 S has been integrated in compact dimensions and within easy reach on the right-hand side of the handlebar. The indicator showing the current position of the handlebar heating switch, in turn, is now integrated in the instrument cluster display.

LED rear lights in clear glass look.
Matching the sporting, dynamic appearance of the new K 1300 S, this is the first model in BMW's four-cylinder series to be fitted as standard with a LED rear light in clear glass look. The use of light-emitting diodes taking the place of conventional bulbs guarantees unimpaired and maintenance-free operation, and extends the service life of the lights several times over.

Digital instrument cluster in new design.
The extra-light instrument cluster on the K 1300 S based throughout on digital technology comes with a newly designed speedometer and rev counter as well as the typical BMW Info-Flatscreen. This Information Display offers the rider permanent information on the temperature of the coolant, the remaining level of fuel in the tank, the time of day, and the gear currently in mesh.

Wherever ESA II Electronic Suspension Adjustment is fitted as an optional extra, the system also provides information on the current set-up of the running gear. Further information available on demand in this case is the current mileage of the motorcycle, trip mileage and – once the level of fuel has dropped to reserve, the range still remaining.

Any defects or interruptions in operation are presented in the Display together with a text message on what has gone wrong. The entire instrument cluster, incidentally, is controlled by a photoelectric cell and is automatically illuminated once it gets dark.

HP Instrument Cluster as special equipment for sports riding.
For very sporting purposes and competitive events, for example on the race track, the new K 1300 S may be equipped with the HP Instrument Cluster already well-known from the HP2 Sport as a special feature.

Developed in close cooperation with the German data recording specialists 2D Systems, this system comes with a large digital display. In the Road Mode it informs the rider on typical points such as road speed, engine speed, mileage, the remaining range on the fuel in the tank and the time spent travelling so far. During the warm-up phase, in turn, the system offers other helpful information for extra convenience.

In the Racing Mode, on the other hand, the HP Instrument Cluster provides additional data such as lap times, maximum engine speed, top speed, or the number of gearshifts. In addition, the HP Instrument Cluster comes with eight freely programmable LED lights which the rider may use, for example, to indicate specific engine speed levels or as external shift indicators.

Large range of functions thanks to the Single-Wire System.
In 2004 BMW Motorrad introduced a brand-new, highly advanced system serving to network electrical and electronic components in the motorcycle referred to as the Single-Wire System first in the R 1200 GS and subsequently in the K 1200 S.

This innovative on-board networking concept is now also featured in the new K 1300 S and, using electronic and CAN-bus technology (CAN = Controller Area Network), offers a much wider range of functions than conventional on-board networks, together with much simpler and more straightforward wiring requirements.

In this network information is transmitted only through one signal path (the single wire). And to keep any interference to an absolute minimum, the path itself is set up as a double-wire system.

The big advantages of this intelligent combination of electrics and electronics are the weight saved on the wiring harness and various components, the high standard of robustness and far-reaching diagnostic capacities. Special electronic equipment may be easily integrated into the network, and in many cases a simple update is all that is required to expand the system.

The basic principle is that all control units interact with one another via one single, joint signal path forming one complete network followed by all signals regardless of their subsequent allocation. This network then provides all information for all affiliated components.

The signals are allocated to their specific purposes at junction points and then go specifically to the appropriate electronic consumers in the various control units. There the information received is processed and subsequently the functions required are activated in the consuming unit.

With this system there is no need to elaborately wire up each function with its own wire. This clearly reduces the number of potential deficiencies inevitably occurring in a conventional on-board network due to the many wires and plug connections – clearly an important factor in the interest of superior reliability.

Communication network and central diagnosis.
All control units form one joint communication network and are able to exchange data among themselves. This allows simple and comprehensive diagnosis of the overall system from one central point. The electronic “brain”

filters out insignificant data and interference signals within a defined tolerance, making the system largely immune to interference such as electromagnetic infiltration.

As on the K 1200 S, a total of five control units including the anti-theft warning system and ABS communicate with one another on the new K 1300 S, the instrument cluster also serving as a control unit.

The BMS-K Digital Motor Electronics control unit is responsible not only for the engine management described above, but also transfers all data to the diagnostic control unit. The Central Vehicle Electrics (CVE), in turn, is responsible for all non-engine-specific electrical features and components.

On-board network without melt-down fuses.
The entire on-board network makes do without conventional melt-down fuses. In the event of a short circuit or malfunction, DVE reliably switches off the function involved, saving information on the cause of the problem for central diagnosis. This allows quick, spec fic and to-the-point allocation of the defect. The big advantage of such electronic management is that CVE automatically re-connects the function involved every time the motorcycle is re-started, checking independently whether the defect still prevails.

Since the other functions are not affected by a possible failure along one of the paths, the entire system as such remains reliable and trouble-free.

The control units also serve as relays, only the starter still being activated by a conventional relay. A compact alternator generating 580 W at 42 Amps supplies the electrical system on the K 1300 S, and the maintenance-free battery has a capacity of 14 Amp-hours.

Electronic immobiliser –
anti-theft security of the highest standard.
Like its predecessor, the K 1300 S is equipped as standard with an electronic immobiliser. Controlled by a transponder integrated in the key, the mobiliser activates an anti-theft system of the highest standard comparable in every respect to the anti-theft warning on a BMW car.

Once the ignition key has been inserted into the ignition lock and the ignition switched on, a chip within the key communicates via the annular aerial in the ignition lock with the Digital Motor Electronics comprising the anti-theft warning algorithms.

Via the Challenge Response Process, as it is called, with the engine's control unit generating a random challenge and the aerial and key responding appropriately in order identify themselves, a communication process is initiated between the coded chip data and the immobiliser data, changing consistently from one start to the next.

As long as the responses from the annular aerial comply with the challenge set, the engine control unit will release the ignition and fuel injection and the motorcycle may be started.

This technology is currently the best and safest immobiliser strategy available in the global market.

1.5 Body and Design.

Even more dynamic from every angle.
The K 1300 S stands out clearly also in its looks from all other models in the market, making an even more sporting and dynamic appearance through its leaner fairing. The overall design of the new K 1300 S combines power with elegance and sportiness with perfection even more than on the previous model. Apart from clearly contoured surfaces merging into one another with their flowing lines, the upper section of the fairing 18 millimetres or 0.71" slimmer and therefore even more sporting than before highlights the dynamic look of the new model.

The different design and contours of the upper fairing section reflect the muscular, athletic character and the agility of this sports motorcycle even more than before. Around the headlight the upper fairing section forms a black, almost grained surface referred to as the “Split Face” offering an even more sporting appearance by dividing the large painted surfaces and the upper fairing on the K 1300 S.

The black intake funnel standing out clearly also disconnects the upper section of the fairing in its looks, emphasising the sporting appearance of the machine. And matching this visual highlight, the hydraulic reservoirs fitted on the two halves of the handlebar for the brakes and clutch now come in smoky glass look.

A gill-shaped air intake and modified colour sections between the black, satinated fairing wedge and the side surfaces on the fairing make the lower section of the fairing look even lighter and more sporting. The optical emphasis on transparency and lightness on all visible technical components on the frame, suspension and the wheels underlines the claim of BMW Motorrad to absolute leadership in technology.

Around the cockpit and leading to the fairing on the main frame, black trim panels again provide an additional optical touch. And last but not least, the new, disconnected fork bridge looks even lighter and more dynamic than before.

In its design the K 1300 S is truly unmistakable, following the successful design of the former K 1200 S. The new model clearly stands out as an absolutely unique machine also within the BMW model range. But still the

K 1300 S, in the harmony of its lines and in its expression, is obviously a BMW and a member of the K-family at very first sight.

Almost every visible part on the motorcycle is also part of the machine's overall design. First and foremost, however, the design of the new K 1300 S is determined and shaped by the new fairing, the inner area of the upper fairing section always in the rider's direct line of vision having been modified for an even more sophisticated and classy look. And the instruments also come in new, unprecedented design.

Even more slender, modular fairing.
The slender power unit featured by the new K 1300 S allows the use of a slender fairing at the top, giving the entire motorcycle a truly slim silhouette from the front.

The slender front end gives even greater emphasis to the dynamic look of the entire motorcycle through the V-shaped transition from the upper section of the fairing into the windshield. This striking V-shape then continues with a clear subdivision of the individual surfaces into the headlight glass and along the front mudguard, giving the unique "face" of the K 1300 S an even more distinctive look than on its predecessor. The direction indicators, finally, are integrated in the rear-view mirrors in typical BMW style, offering an exceptionally good line of vision.

On the road the optimised fairing of the new K 1300 S bears out its superior aerodynamic qualities resulting from a wide range of comprehensive tests in the wind tunnel. The objective was to maintain best-in-class protection from wind and weather despite the slender and sporting silhouette of the machine. Once again, therefore, the emphasis was on riding in relaxed style, and not on breaking theoretical records such as minimum air resistance.

As before, the flow of air along the fairing is guided by the contours of the new machine and the convex "spade" design at the sides of the windshield, keeping wind pressure on the rider's body to a minimum and guiding rainwater around the rider's shoulders.

Gill-like openings at the top of the side fairing use differences in air pressure to guide rainwater around the rider's feet to the inside and beneath the motorcycle. A carefully designed additional splashguard likewise serves to minimise any contamination at the side and rear.

At the front the shape of the mudguard supports the flow of air to the radiator. The flow of air to the oil cooler and the coolant radiator is indeed so efficient that the K 1300 S, despite its high output and supreme performance, requires only a relatively small radiator surface.

Thanks to the proven modular structure of the fairing, partial disassembly of fairing components for servicing does not involve a major effort. The front end made up of two plastic shells is a monocoque structure and offers a wide range of supports and fastening options for cables and other fairing components. The headlight, in turn, is a load-bearing element at the front end, helping to keep the overall structure light and easy to remove and re-fit.

Headlights with a clear glass cover and reflectors in free-form surface technology add another striking touch.
Like the K 1200 S, the new K 1300 S comes with a strikingly designed headlight made up of no less than three light units, one low beam and two high beams with fully integrated H7 bulbs. The clear glass cover on the headlight is made of impact- and scratch-proof extra-light polycarbonate. The reflectors come in free-form surface technology to exactly maintain light requirements and provide excellent light intensity and illumination of the road ahead. To change the bulbs, finally, the headlight is easily accessible from both behind and beneath.

Fuel tank and seat in perfect ergonomic design.
As on the former model, the fuel tank on the K 1300 S is made of light but strong plastic and offers a capacity of 19 litres or 4.2 imp gals (including 4 litres/0.9 imp gals reserve). To lower the centre of gravity, the fuel tank is almost in the middle of the motorcycle behind the airbox.

Thanks to the overall package of the K 1300 S, the tank is particularly slender beneath the rider for optimum knee support and grip. The ongoing shape and design of the tank follows functional criteria and the space available: Despite its compact design, the tank offers maximum capacity on minimum use of material.

Production of the tank in the rotation process provides maximum freedom in design. This freedom has been used to give the tank fairing even more distinctive contours creating a very attractive interplay of light and shade, the individual surfaces taking on a new look from every perspective.

The seat also follows this timeless and highly appealing design language continuing into the trim panels at the rear. The essential criterion for the double seat bench designed along the same lines as on the former K 1200 S

is the rider's step arch length, as it is called, measuring 1,810 mm or 71.3". This is the distance measured along the inside of the rider's legs between his two feet resting on the ground, considering not only the absolute, geometric height of the seat, but also the shape and width of the rider's seat at the front, where he actually sits.

While the seat is not adjustable, its waist-like shape tapering down towards the fuel tank allows the rider to easily place his feet on the ground and gives him extremely comfortable knee support at the sides, together with the usual freedom of movement offered by BMW also for the sporting rider.

The geometric seat height of the regular seat is 820 millimetres or 32.3". Shorter riders are able, as on the former model, to order a lower seat with step arch length of 1,750 millimetres or 68.9" and a geometric seat height of 790 millimetres/31.1" as an option at no extra cost, or to have such a lower seat fitted subsequently at an extra price.

Despite the sporting and slender lines of the machine, the engineers at BMW Motorrad have given particular attention to an adequately wide seat area and ample support offered by the seat for both the rider and passenger. In all, this ensures a standard of seating comfort quite supreme in the sports motorcycle segment, particularly for the pillion rider.

Despite all its sporting character, the new K 1300 S is therefore just as suitable for grand touring and riding with a passenger as every other BMW motorcycle. And last but not least, lashing straps for luggage beneath the seat again enhance the touring qualities of the K 1300 S.

1.6 Range of Equipment.

Optional extras and special equipment offering a wide range of customisation.
Thanks to its sophisticated ergonomic qualities, the sporting K 1300 S is fully suitable for long distances and grand tours. A new feature available for the K 1300 S is a luggage rack upgrading the all-round and touring qualities of the machine. Indeed, the new luggage rack supplements the existing baggage features already offered by BMW Motorrad in carrying all kinds of luggage on the motorcycle.

Further customisation is ensured by the usual wide range of options and special equipment from BMW Motorrad. Particularly the sports-minded rider will therefore enjoy the new K 1300 S even more with the HP Gearshift Assistant, the HP Infodisplay as well as HP trim components made of carbon.

Optional extras are delivered straight from the factory and are fitted during the production process. Special equipment is fitted by the BMW Motorcycle Dealer also providing a wide range of retrofitting options.

Optional extras:
- Heated handles.
- Luggage rack (new).
- Low rider's seat (approx 790 mm/31.1", step arch length 1,750 mm/68.9").
- Anti-theft warning system.
- ESA II (Electronic Suspension Adjustment II; new).
- HP Gearshift Assistant (new).
- Multi-colour paintwork.
- ASC Anti-Slip Control.
- TPC Tyre Pressure Control.
- On-board computer including oil level warning.

Special equipment:
Luggage and storage options:

- Luggage rack with installation kit.
- Watertight tank rucksack (new).
- Watertight tank bag including fastening elements.
- Set of sports cases including case supports.
- Sports softbag, small, 19 litres/large, 51 litres.
- Watertight luggage roll, 53 litres, including fastening belt with tightening lock.
- Multi-strap fastening rope.

Service and technical features:

- HP Gearshift Assistant (new).
- HP Instrument Cluster (new).
- Main stand.
- On-board toolkit – service kit.
- Paddock stand including adapter.
- 230 V/110 V battery charger including adapter.
- Repair kit for tubeless tyres.
- Repair instructions for K-models, DVD.
- Motorcycle cleaner.

Ergonomics and comfort.

- Heated handles with switch unit.
- Low rider's seat (approx 790 mm/31.1", step arch length 1,750 mm/68.9").
- Windshield, tinted.

- HP rider footrests (new).
- HP passenger footrests (new).
- HP forged wheels, front (3.50 x 17") and rear (6.00 x 17").

Design and sound:

- HP carbon seat cover.
- HP carbon clutch cover.
- HP carbon heat protector for standard muffler (new).
- Akrapović® sports muffler (new).
- HP carbon tank cover (new).
- HP carbon wheel cover, front.
- HP carbon airbox cover.

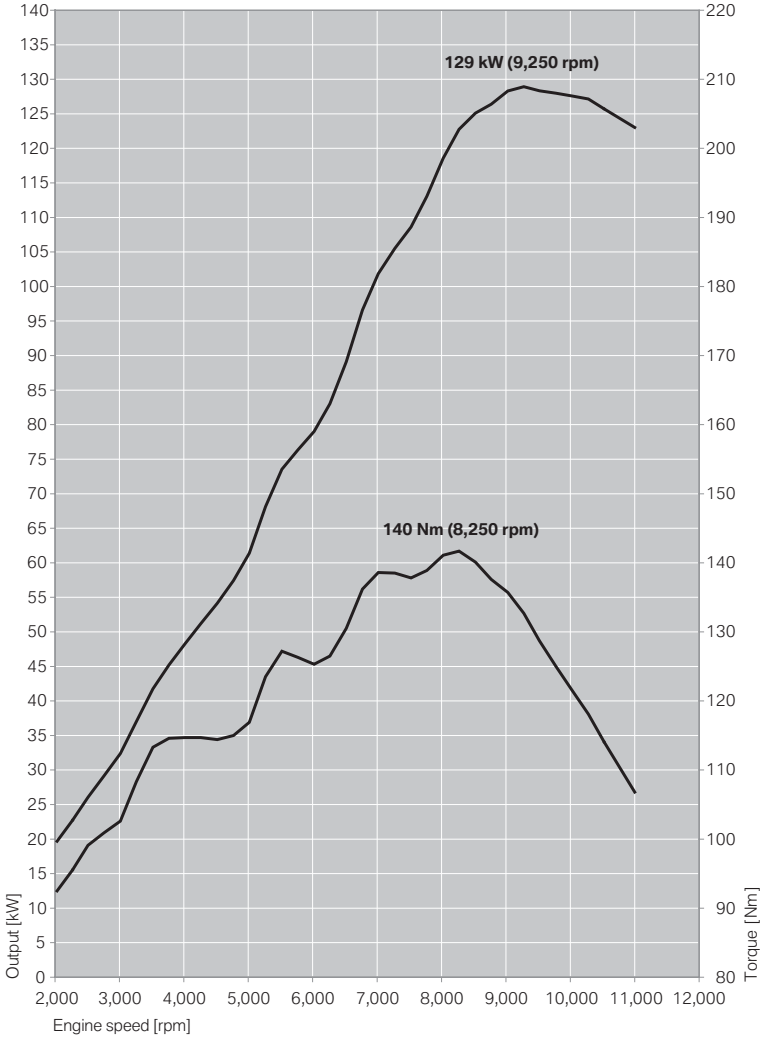
Safety:

- Electronic immobiliser with remote control.
- Splashguard at the rear.
- First-aid kit, large/small.
- Motorcycle cover.

Navigation and communication:

- BMW Motorrad ZUMO navigation and communication unit incl support (new).

1.7 Engine Output and Torque. BMW K 1300 S.



1.8 Specifications. BMW K 1300 S.

Power Unit	
Configuration	Water-cooled four-stroke straight-four power unit, two camshafts, four valves per cylinder
Bore x stroke	80 mm x 64.3 mm (3.15 x 2.53")
Capacity	1,293 cc
Max output	127 KW (175 hp) at 9,250 rpm
Max torque	140 Nm/103 lb-ft at 8,250 rpm
Compression ratio	13.0 : 1
Fuel supply/ engine management	Electronic fuel injection, Digital Motor Electronics with integrated knock control (BMS-K)
Valve/gas control	DOHC (double overhead camshaft)
Diameter inlet	32
Diameter outlet	27,5
Throttle valve diameter	46
Exhaust management	Fully controlled three-way catalyst, EU3 emission standard
Performance/Fuel Consumption	
Top speed	200 km/h (124 mph) +
Fuel consumption at a steady 90 km/h (56 mph)	4.7 ltr/100 km (60.1 mpg imp)
Fuel consumption at a steady 120 km/h (75 mph)	5.3 ltr/100 km (53.3 mpg imp)
Fuel grade	Premium Plus, unleaded, 98 RON; automatic knock control also allowing the use of premium down to 95 RON
Electrical System	
Alternator	580 W three-phase alternator
Battery	12 V/14 Ah, maintenance-free
Power Transmission	
Clutch	Multiple-plate clutch in oil bath, hydraulically operated
Gearbox	Dog-shift six-speed gearbox
Primary Transmission	1,559
Transmission, gear stages	
I	2,398
II	1,871
III	1,525
IV	1,296
V	1,143
VI	1,015
Secondary drive	Drive shaft

Suspension/Brakes	
Frame	Bridge frame, aluminium, engine load-bearing
Front wheel guidance/ spring elements	BMW Motorrad Duolever; central spring strut
Rear wheel guidance/ spring elements	Cast aluminium single swing arm with BMW Motorrad Paralever; central spring strut with lever system, spring pre-tension adjustable infinitely by hand wheel in a hydraulic process, rebound damping adjustable
Spring travel, front/rear	115 mm/135 mm (4.52"/5.31")
Wheelbase	1,585 mm (62.4")
Suspension/Brakes	
Castor	104.4 mm (4.11")
Steering head angle	60.4°
Wheels	Cast aluminium wheels
Rim dimensions, front	3.50 x 17"
Rim dimensions, rear	6.00 x 17"
Tyre, front	120/70 ZR 17
Tyre, rear	190/55 ZR 17
Brake, front	Double-disc brake, floating brake discs, diameter 320 mm (12.6"), four-piston fixed calliper
Brake, rear	Single-disc brake, diameter 265 mm (10.4"), double-piston floating calliper
ABS	Standard: BMW Motorrad Integral ABS (semi-Integral)
Dimensions/Weight	
Seat height	820 mm/32.3" (low seat: 790 mm/31.1")
Step arch length	1,810 mm/79.3" (low seat: 1,750 mm/68.9")
Weight, unladen, in road trim and with full tank	254 kg (560 lb)
Dry weight	228 kg (503 lb)
Max permissible	460 kg (1,014 lb)
Max load (in standard trim)	206 kg (454 lb)
Useful tank capacity	19 ltr (4.2 imp gals)
Thereof reserve	approx 4.0 ltr (0.9 imp gals)
Length	2,182 mm (85.9")
Height (without mirrors)	1,221 mm (48.1")
Width (on mirrors)	905 mm (35.6")

1.9 The K 1300 S Colour Range.

The colour concept of the new BMW K 1300 S accentuates the unmistakable character of this new machine. The non-metallic colours form a strong and powerful contrast to the black surfaces at the front, giving the K 1300 S an even more compact and agile look from the side.

The colours available are Light Grey Metallic and Lava Orange Metallic.

The unique multi-colour finish in Granite Grey Metallic/Light Grey Metallic with Magma Red highlights, in combination with wheels finished in Glossy Black, creates the sophisticated and striking look so typical of BMW and appealing above all to the sporting, performance-minded rider. The frame and suspension components on all colour variants are finished in Asphalt Metallic.

2. The new BMW K 1300 R.
2.1 Features and Technical Highlights.

Making a significant departure from traditional sports motorcycle concepts, BMW proudly presented the “most powerful naked bike of all times” at the 2004 INTERMOT Motorcycle Show: the BMW K 1200 R. Ever since it has been a well-known fact that BMW is by all means willing and able to openly demonstrate extreme power and extroverted design in genuine style.

Now the significantly uprated successor to the BMW K 1200 R is making its world debut at the 2008 INTERMOT Motorcycle Show in the BMW Urban Encounter World – the new K 1300 R, the most powerful naked bike BMW has ever built.

Developing maximum output of 127 kW (173 hp) and weighing exactly 243 kg (536 lb) with a full tank, this extravagant Power Roadster, one of the most powerful and dynamic machines in its segment, fulfils the greatest demands in terms of riding dynamics without in any way neglecting the particular wishes and preferences of the BMW customer in terms of safety, equipment and riding comfort. Hence, BMW remains at the top also in the special category of Power Naked Bikes.

Even more sporting, superior and dynamic.
The K 1300 R Power Roadster is a high-performance riding machine offering a perfect blend of performance, riding safety and technical features carried over from the K 1300 S. So while the drivetrain and running gear are carried over from the K 1300 S, they have been modified in this case to meet the particular requirements of a large-capacity naked bike. The most significant and outstanding considerations in developing the K 1300 R were indeed to offer the rider supreme riding pleasure combined with equally outstanding safety on the road as well as the most sophisticated design features and an extroverted, masculine look.

Suspension geometry upgraded to an even higher standard than on the previous K 1200 R gives the K 1300 R even greater agility combined with the same high standard of riding stability as before. The basic technical data on the suspension are now the same as on the K 1300 S. In comparison with the previous K 1200 R, the BMW Duolever front-wheel suspension is now slightly lower, with the wheelbase of the new model being correspondingly longer.

The guide ducts on the engine have likewise been modified for the new machine, with maximum output of 127 kW (173 hp) almost the same as on the K 1300 S. Quite generally, both engine output and torque have been increased significantly over the previous model, while the shorter final drive ratio of 2.91 versus 2.82 on the K 1300 S likewise has a positive impact on the acceleration and pulling power of the new machine.

Technical Highlights – an Overview:

- Even more dynamic, particularly at lower and medium engine speeds, thanks to the increase in engine capacity.
- Engine output 127 kW (173 hp) at 9,250 rpm, maximum torque 140 Newton-metres (103 lb-ft) at 8, 250 rpm.
- Increase in torque by more than 10 Newton-metres (7.4 lb-ft) all the way from 2,000–8,000 rpm.
- Newly tuned Digital Motor Electronics to fulfil the highest environmental standards.
- Optimised charge process for greater performance and lower fuel consumption.
- Optimised exhaust system with a new rear-end muffler and electronic flap control as well as a fully controlled three-way catalyst.
- Desmodromic operation of the power application function to improve dosage of engine power.
- Even greater riding precision combined with maximum riding stability ensured by the optimised Duolever front wheel suspension with a newly designed longitudinal arm at the bottom.
- Firmer spring/damper set-up for even better feedback to the rider.
- Supreme handling ensured by optimised suspension geometry, optimum mass distribution and a perfectly balanced overall concept.
- Second-generation ESA II electronically adjustable suspension and ASC anti-spin control as an option.
- New, innovative generation of control switches with optimised ergonomics.

- Optimised, maintenance-free shaft drive with a new two-stage drive shaft.

- HP Gearshift Assistant for shifting up without the slightest interruption of power and traction available as an option.

- Wide range of standard features and accessories tailored to the K 1300 R, all offering the usual supreme qualities of a BMW.

Increase in engine size for significantly better performance.
Like the K 1300 S, the new K 1300 R also benefits from the significant improvement and upgrading of the straight-four power unit now increased in size from 1,157 to 1,293 cc. Maximum output is now 127 kW (173 hp) at 9,250 rpm, maximum torque is 140 Newton-metres (103 lb-ft) at 8,250 rpm, an increase in power by 7 kW (10 hp) and an increase in torque by 13 Newton-metres (9.6 lb-ft).

While the former K 1200 R reached its maximum output at 10,250 rpm, the power unit in the new K 1300 R develops its maximum power at a significantly lower 9,250 rpm. A further advantage is that more than 70 per cent of the engine's maximum torque is available from just 3,000 rpm, just as the K 1300 R offers more than 10 per cent more torque than the K 1200 R all the way from 2,000 to 8,000 rpm.

This clearly reflects the objective of the engineers developing the new machine, focusing on even greater driving dynamics with significantly more traction and much better acceleration than on the former model already so successful in the market.

Like the K 1200 R, the new K 1300 R comes with a shorter final drive ratio (2.91 instead of 2.82), improving both acceleration and pulling power to an even higher standard.

All technical modifications serving to optimise the engine and drivetrain are the same as on the new K 1300 S. The airbox comes with a modified air filter and a newly set-up intake funnel versus the K 1200 R to meet the greater demand of the engine for a smooth and efficient supply of air. And last but not least, the oil cooler with its larger block again reflects the greater power and performance of the engine.

Sporting rear muffler with exhaust flap.
Like the K 1300 S, the new K 1300 R comes with a new rear muffler not only making an important contribution to the machine's "beefy" torque curve and riding qualities, but also providing an even more powerful sound full

of character. This special effect is provided by an electronically controlled exhaust flap reducing the damper volume with a higher throughput rate. Through its hexagonal design and smaller dimensions, the muffler looks particularly compact and sporting to clearly underline the muscular stance of the K 1300 R.

The K 1300 R is available with a very light and sporting slip-on muffler made of titanium complete with a carbon trim cover from Akrapović® as special equipment.

New gearshift kinematics and HP Gearshift Assistant.
Like the K 1300 S, the K 1300 R features a new gearshift lever with an ergonomically optimised pivot point. Together with the likewise new anti-friction bearing on the gearshift lever, this ensures an even more precise and faster gearshift particularly when the rider opts for a more sporting and dynamic style of riding.

For the first time in the history of series production BMW motorcycles and indeed for the first time worldwide in series production, the rider of the new K 1300 R is able to shift up without operating the clutch or taking back the gas handle, that is with hardly the slightest interruption of power and traction, by means of the HP Gearshift Assistant available as an optional extra. Introduced for the first time on the BMW HP2 Sport, the HP Gearshift Assistant may be combined with the sport footrests likewise available as special equipment on the new machine.

Optimised suspension geometry,
even firmer spring and damper settings.
The suspension geometry on the new K 1300 R has been mod fied versus the former configuration in the interest of even greater agility and is now the same as on the K 1300 S. This improvement is ensured by a different process in machining the wheel carrier and through the Duolever suspension featuring a newly designed longitudinal arm at the bottom with a newly defined pivot point. As a result, the front-wheel guidance angle is now slightly lower and the wheelbase of the new machine has been increased accordingly.

The K 1300 R meets the significant demands made of a Naked Power Bike in terms of sportiness and riding dynamics through the even firmer set-up of the gas-pressure spring strut.

The new K 1300 R comes as standard on a 180/55 ZR 17
(K 1300 S: 190/55 ZR 17) rear-wheel tyre. As an option the particularly sporting rider may choose BMW sports wheels from BMW Motorrad's wide

range of optional extras and special equipment, allowing the use of a 190/55 ZR 17 tyre. Again in the interest of even better handling and greater performance, this special tyre replaces the usual 190/50 ZR 17 tyre.

Electronically adjustable ESA II running gear.
BMW's new ESA II (Electronic Suspension Adjustment II) running gear is available as special equipment at extra cost also on the K 1300 R.

This allows the rider to vary not only the damping effect on the two spring struts and the spring base (spring pre-tension) on the rear spring struts, but also the spring rate and, accordingly, spring hardness conveniently at the touch of a button. Hence, the rider is able to set the running gear very conveniently and more precisely than ever before to his specific wishes and the weight the motorcycle is carrying under all riding and load conditions, thus enjoying a new dimension of riding stability combined with optimum response at all times.

ESA II is the world's first system for electronic adjustment of the motorcycle's suspension offering such a wide range of setting options.

EVO brake system.
The K 1300 R also comes with BMW Motorrad's proven EVO brake system featured on other models in the Boxer and K-Series. The brake lines are protected by steel sleeves, brake discs measuring 320 millimetres/12.6" at the front and 265 millimetres/10.4" at the rear ensure maximum stopping power even from very high speeds and with the motorcycle carrying a heavy load.

Further benefits of the EVO brake system are its unparalleled brake pressure build-up rate and the reduction of operating forces to a minimum even when braking all-out – qualities the system has proven in many tests. Indeed, the BMW EVO brake system – EVO stands for evolution – is already renowned in the market as one of the safest and most effective brake technologies available.

Handlebar detached for minimum vibration, new controls and switches.
The new K 1300 R features a handlebar detached from the frame of the machine in the interest of minimum vibration, a technology carried over from the K 1200 R Sport. The big advantage is the higher standard of everyday riding quality particularly on longer distances.

Another new highlight on the K 1300 R is the brand-new generation of switches and controls. Featuring MID (Moulded Interconnect Device) technology, the new control units are far smaller and more compact and at the same time offer an even higher standard of functionality, clear design and optimum access for easy reach.

HP instrument cluster as special equipment for sports riding.
The new K 1300 R may be equipped with the HP instrument cluster already well-known from the HP2 Sport as special equipment for the most sporting and dynamic riding requirements, for example on the race track.

This superior system developed in cooperation with the German data specialist 2D Systems comes with a large digital display informing the rider in the Road Mode on typical features and data such as road speed, engine speed, mileage covered so far, remaining mileage on the fuel available, and the time spent travelling. During the warm-up phase, in turn, the instruments offer further helpful data.

In the Racing Mode the instrument cluster presents data such as lap times, maximum engine speed, road speed, or the number of gearshifts.

The HP instrument cluster comes additionally with eight freely programmable LED lights serving, for example to present engine speed or acting as an external gearshift indicator.

Even more dynamic, masculine and aggressive look.
With its even more muscular design, the new K 1300 R simply oozes a strong feeling of power and performance at very first sight, standing out clearly from its competitors and leaving behind an impressive visual message through its even more dynamic appearance.

The newly designed fairing on the front wheel mount and the compact front wheel mudguard give even greater emphasis to the front end of the K 1300 R, making it look even sleeker and more dynamic. The aggressively styled radiator trim panels, in turn, demonstrate even more power and performance than before. The intake panel is also new in its design and is now fully painted, supporting the powerful, dynamic look of the K 1300 R through its almost rough and jagged form.

The side covers are even more striking in design, offering even better protection of the rider's knees from wind and weather through their contoured edges. A modified headlight body as well as new paintwork on the headlight panel, in turn, give the K 1300 R a new and even more aggressive face at

the front. To match this outstanding look, finally, the hydraulic reservoirs fitted on the two halves of the handlebar for the brakes and clutch now come in a discreet smoky glass look.

Mod fied instrument graphics in clear, techno-like layout clearly demonstrate the design of the new machine to the rider himself. The newly designed rear light in LED technology and with a white clear glass look conveys an exciting touch of technical excellence and a superior look of harmony together with the white direction indicator lights.

Comfort seat for the passenger as special equipment.
Apart from unparalleled riding pleasure on country roads, the new K 1300 R offers supreme all-round qualities through its outstanding power unit. And to enhance riding comfort for the pillion rider to an even higher level, BMW Motorrad offers a seat bench much wider and more upholstered at the rear.

2.2 Range of Equipment.

Optional extras and special equipment –
sporting customisation BMW-style.
It almost goes without saying that even the very sporting and dynamic K 1300 R comes with the very best all-round qualities so typical of BMW – also for long distances and tours. The new features boasted by the K 1300 R also include a special comfort seat for the pillion rider as well as LED direction indicators both front and rear.

The usual wide range of options and special equipment from BMW Motorrad serves to further customise this outstanding machine. The particularly sports-minded rider, for example, has the choice of the HP Gearshift Assistant, the HP Info Display as well as carbon trim components as special features on the new K 1300 R.

Optional extras are delivered straight from the factory and integrated during production. Special equipment is fitted by the BMW Motorcycle Dealer either right from the start or at a later point in time, whatever the customer wishes.

Optional extras.
- Heated handles.
- Lower rider's seat (approx 790 mm/31.1", step arch length 1,750 mm/68.9").
- Passenger comfort seat (new).
- Luggage rack.
- BMW Motorrad Integral ABS.
- Anti-theft warning system.
- ESA II (Electronic Suspension Adjustment II; new).
- HP Gearshift Assistant (new).
- ASC Anti-Slip Control.
- TPC Tyre Pressure Control.

- On-board computer including oil level warning.
- BMW 6.0 x 17" sports wheels on 190/55 ZR 17 tyres.
- Sports windshield.
- LED direction indicators front and rear.

Special equipment.
Luggage and storage options.

- Luggage rack with installation kit.
- Water-tight tank rucksack (new).
- Water-tight tank bag including fastening elements.
- Set of sports cases including case supports.
- Sports softbag, small, 19 litres/large, 51 litres.
- Water-tight luggage roll, 53 litres, including fastening belt with tightening lock.
- Multi-strap fastening rope.

Service and technical features.

- HP Gearshift Assistant (new).
- HP Instrument Cluster (new).
- Main stand.
- On-board toolkit – service kit.
- Paddock stand including adapter.
- 230 V/110 V battery charger including adapter.
- Repair kit for tubeless tyres.
- Repair instructions for K-models, DVD.
- Motorcycle cleaner.

Ergonomics and comfort.

- Heated handles with switch unit.
- Low rider seat (approx 790 mm/31.1", step arch length 1,750 mm/68.9").
- Passenger comfort seat.
- Sports windshield, tinted, including fastening elements.
- HP rider's footrests (new).
- HP passenger's footrests (new).
- HP forged wheels, front (3.50 x 17") and rear (6.00 x 17").

Design and sound.

- LED direction indicators.
- HP carbon windshield (new).
- HP carbon wheel cover, front.
- HP carbon clutch top cover (new).
- HP carbon engine spoiler.
- HP carbon seat cover.
- HP carbon heat protector for standard muffler (new).
- Akrapović® sports muffler (new).

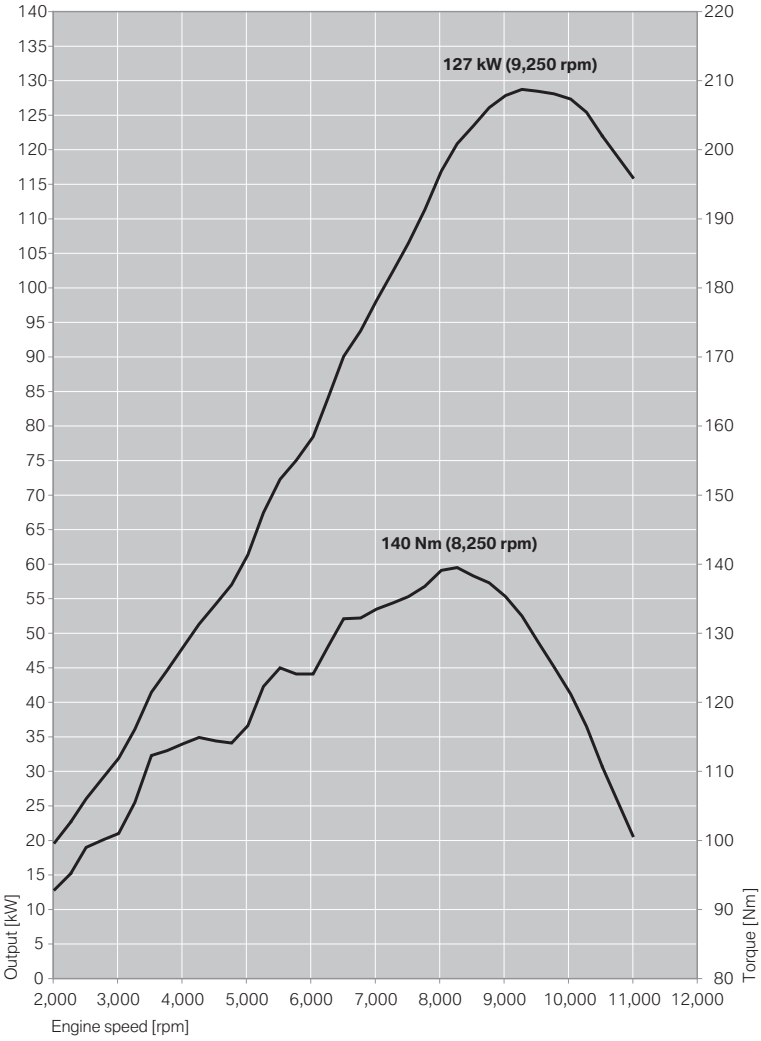
Safety.

- Anti-theft warning system with remote control.
- Mudguard, rear.
- First-aid kit, large/small.
- Motorcycle cover.

Navigation and communication.

- BMW Motorrad ZUMO navigation and communication unit incl support (new).

2.3 Engine Output and Torque. BMW K 1300 R.



2.4 Specifications. BMW K 1300 R.

Power Unit	
Configuration	Water-cooled four-stroke straight-four, two camshafts, four valves per cylinder
Bore x stroke	80 mm x 64.3 mm (3.15 x 2.53")
Capacity	1,293 cc
Max output	127 KW (173 hp) at 9,250 rpm
Max torque	140 Nm/103 lb-ft at 8,250 rpm
Compression ratio	13.0 : 1
Fuel supply/ engine management	Electronic fuel injection, Digital Motor Electronics with integrated knock control (BMS-K)
Valve/gas control	DOHC (double overhead camshaft)
Diameter inlet	32
Diameter outlet	27,5
Throttle valve diameter	46
Exhaust management	Fully controlled three-way catalyst, EU3 emission standard
Performance/ fuel consumption	
Top speed	200 km/h (124 mph) +
Fuel consumption at a steady 90 km/h (56 mph)	5.0 ltr/100 km
Fuel consumption at a steady 120 km/h (75 mph)	5.8 ltr/100 km
Fuel grade	Premium Plus, unleaded, 98 RON; automatic knock control also enabling the engine to run on premium fuel down to 95 RON
Electrical System	
Alternator	580 W three-phase alternator
Battery	12 V/14 Ah, maintenance-free
Power Transmission	
Clutch	Multiple-plate clutch in oil bath, hydraulically operated
Gearbox	Dog-shift six-speed gearbox
Primary Transmission	1,559
Transmission, gear stages	
I	2,398
II	1,871
III	1,525
IV	1,296
V	1,143
VI	1,015
Secondary drive	Drive shaft

Suspension/Brakes	
Frame	Bridge frame, aluminium, load-bearing engine
Front wheel guidance/ spring elements	BMW Motorrad Duolever; central spring strut
Rear wheel guidance/ spring elements	Cast aluminium single swing arm with BMW Motorrad Paralever; central spring strut with lever system, spring pre-tension with infinite hydraulic adjustment by hand wheel, adjustable inbound damping
Spring travel, front/rear	115 mm/135 mm (4.52/5.31")
Wheelbase	1,585 mm (62.4")
Castor	104.4 mm (4.11")
Suspension/Brakes	
Steering head angle	60.4°
Wheels	Cast aluminium wheels
Rim, front	3.50 x 17"
Rim, rear	5.50 x 17"
Tyre, front	120/70 ZR 17
Tyre, rear	180/55 ZR 17
Brake, front	Double-disc brake, floating brake discs, diameter 320 mm (12.6"), four-piston fixed calliper
Brake, rear	Single-disc brake, diameter 265 mm (10.4"), double-piston swing calliper
ABS	Optional: BMW Motorrad Integral ABS (semi-integral)
Dimensions/Weight	
Seat height	820 mm (32.3") (low seat 790 mm/31.1")
Step arch length	1,810 mm (71.3") (low seat 1,750 mm/68.9")
Weight, unladen, in road trim and with full tank	243 kg (536 lb)
Dry weight	217 kg (478 lb)
Max permissible	460 kg (1,014 lb)
Max load (with motorcycle in standard trim)	217 kg (478 lb)
Useful tank capacity	19 ltr
Thereof reserve	approx 4.0 ltr
Length	2,228 mm (87.7")
Height (without mirrors)	1,095 mm (43.1")
Width (on mirrors)	856 mm (33.7")

2.5 The K 1300 R Colours Range.

Contrary to the former model, the frame, wheel carriers and drivetrain come in the same colour on all three colour variants of the K 1300 R. This is because the black engine and suspension components such as the frame and wheel carriers in Asphalt Metallic symbolise the technical character and sporting style of the new K 1300 R.

The body colours highlight the newly designed features and the strong character of the new K 1300 R, in particular the muscular front end and the slender rear. While Silk Metallic stands for masculine strength and determination, Lava Orange Metallic creates a sporting, almost provocative touch.

Reflecting the current Zeitgeist, white is now back in the market, nevertheless re-interpreted in this case as Light Grey Metallic with a larger share of metallic components emphasising the three-dimensional presence of a motorcycle from BMW.

The graphically much more aggressive model designation stands out clearly but in full harmony on all colour variants.

3. The BMW K 1300 GT.
3.1 Features and Technical Highlights.

Introducing the new K 1300 GT, BMW Motorrad is opening up new dimensions in the BMW Touring Encounter World in terms of both riding dynamics and grand touring qualities, enhancing the Company's worldwide leadership in the Dynamic Tourer segment.

Offering even greater supremacy all along the drivetrain, an even higher standard of quality, an aerodynamic fairing enhanced to a new level of perfection, and a wide range of special equipment, the new K 1300 GT stands for Gran Turismo of the highest calibre. It combines maximum agility and sporting riding dynamics with the ideal package for long tours. And with its engine output 118 kW (160 hp), together with maximum torque of 135 Newton-metres (99 lb-ft), the new K 1300 GT also benefits from the increase in engine size and stands out as one of the most powerful motorcycles in its segment. In typical BMW style, therefore, the new K 1300 GT meets the greatest demands in terms of riding dynamics, comfort, safety, and equipment.

Even greater supremacy and dynamic performance.
The new K 1300 GT is a High Performance Tourer featuring the innovative and proven highlights of the new K 1300 S in terms of performance, riding safety and technology. The drivetrain and suspension come largely from the K 1300 S, but have been adapted in their specific features and details to all the requirements of a dynamic tourer. The highlights in developing the new K 1300 GT were enhanced riding dynamics and even greater supremacy combined with outstanding comfort and optimum qualities for all kinds of motorcycle tours.

Identical in its basic features with the power unit of the K 1300 S, the engine has been modified in terms of air flow and guidance. This increases maximum output over the K 1200 GT by 6 kW (8 hp) to a new record level of 118 kW (160 hp), with even greater emphasis given to superior torque for even better traction and pulling force at low and medium engine speeds.

The K 1300 GT also sets the standard in terms of comfort, riding safety and equipment, not only through its excellent suspension and running gear, but also through optionally available, electronically adjustable ESA II (Electronic Suspension Adjustment II) as well as features such as electronic cruise control, an electrically adjustable windshield, or seat heating controlled individually for the rider and passenger.

An overview of technical highlights:

- Even more traction and pulling force, particularly at low and medium engine speeds, through the increase in engine capacity.
- Engine output 118 kW (160 hp) at 9,000 rpm, peak torque of 135 Newton-metres (99 lb-ft) at 8,000 rpm.
- Significant increase in torque from 3,500 rpm.
- Fulfilment of the strictest environmental standards through newly set-up Digital Motor Electronics.
- Optimisation of the emission system through rear mufflers modified inside and a fully-controlled three-way catalytic converter.
- Desmodromic operation of the gas lever function for even better and more precise gas dosage.
- Optimised, maintenance-free shaft drive with a new, two-stage drive shaft.
- Even greater driving precision and optimised response combined with maximum riding stability ensured by the optimised Duolever front-wheel suspension complete with a newly designed lower longitudinal arm.
- Second-generation ESA II Electronically Adjustable Suspension and ASC Anti-Spin-Control as an option.
- New, innovative generation of switches and controls with optimised ergonomics.
- Integral ABS (semi-integral) featured as standard for a high level of active safety.
- Wide range of equipment and accessories tailored to the new machine at BMW's usual high level of perfection.
- Seat and handlebar adjustable.
- Optimised full fairing.
- Electrically adjustable windshield.

Increase for engine capacity for even greater traction and enhanced performance.
Like the K 1300 S, the new K 1300 GT also benefits from the significantly upgraded straight-four power unit increased in capacity from 1,157 to 1,293 cc. Maximum output is now 118 kW (160 hp) at 9,000 rpm, with peak torque of 135 Newton-metres (99 lb-ft) at 8,000 rpm. This equals an increase in power by 6 kW (8 hp) and an increase in torque by 5 Newton-metres or 3.7 lb-ft.

While the former K 1200 GT did not develop its maximum output until 9,500 rpm, the power unit of the new K1300 GT offers its maximum power at 9,000 rpm, with more than 80 per cent of the engine's maximum torque available from just 3,500 rpm. Again versus the K 1200 GT, the torque curve is sign ficantly better over a wide range from 3,500 – 10,000 rpm, following the objective to offer significantly more traction and pulling force particularly at low and medium engine speeds.

The torque curve remaining at a high ceiling over a wide range of engine speed is indeed virtually ideal for the K 1300 GT as a genuine Gran Turismo, offering even more practical performance and supreme power than its predecessor, which already set the standard in this segment.

While all features optimised on the engine and drivetrain of the new K-Series also benefit the new K 1300 GT, the airbox has been specifically adjusted to the different air requirements and flow conditions within the engine, featuring an optimised air filter and newly set-up intake funnels versus the former model.

Rear muffler with new features and new interior design.
The rear muffler newly designed and set-up inside also contributes to the even "beefier" torque curve and enhanced riding qualities of the K 1300 GT, standing out clearly through its supreme and powerful rumble. Contrary to the very sports-minded K 1300 S and K 1300 R, the exhaust system on the K 1300 GT with its substantial damper volume and consistent use of stainless steel throughout does not require an electronically controlled exhaust butterfly.

Shift lever running in anti-friction bearings for an even more precise gearshift.
The optimised anti-friction bearing on the gearshift lever with a corresponding reduction in tolerance in the transmission of power ensures an even more precise and faster gearshift than ever before.

Optimised BMW Duolever for minimum unsprung masses.
While the new K 1300 GT is based on the particularly stable suspension geometry of its predecessor, the unsprung masses of the BMW Duolever have been reduced even further through the introduction of a newly designed lower longitudinal arm. Now made of forged aluminium, the new Duolever gives the motorcycle an even smoother and finer response.

Electronically adjustable ESA II suspension.
BMW's new ESA II (Electronic Suspension Adjustment II) suspension is also available on the K 1300 GT as an option at extra cost.

This allows the rider, apart from the damping on the two spring struts, to also adjust the spring base (spring pre-tension) on the rear spring strut as well as its spring rate and spring hardness smoothly and conveniently at the touch of a button. Hence, he is able to set the suspension most conveniently and more precisely than ever before to his personal wishes, taking particularly the load the motorcycle is carrying into account (which is of particular sign ficance with the K 1300 GT) and offering a new dimension of riding stability combined with optimum response under all riding and load conditions.

ESA II is the world's first electronic suspension control on the motorcycle offering such a wide range of adjustment options.

EVO brake system complete with BMW Integral ABS.
The new K 1300 GT is equipped with BMW's proven EVO brake system also featured on the other models in the K- and R-Series. Brake discs measuring 320 millimetres/12.6" in diameter up front and 294 millimetres/11.6" in the rear guarantee optimum deceleration also from high speeds and under maximum load.

Featured as standard, BMW Motorrad Integral ABS (semi-integral) not only fu fils the highest demands in terms of safety, but also caters for the wishes and preferences of the sports-minded rider through its special set-up and configuration: BMW Motorrad Integral ABS controls the front- and rear-wheels brakes through the handbrake lever, while the footbrake lever acts only on the rear-wheel brake.

Even more dynamic in design.
The unusually slender full-fairing with its dynamic contours and excellent aerodynamic qualities has been carried over from the former model and upgraded in its looks for the new K 1300 GT.

The new fairing differs from the former unit at the side through an opening in the side panel and the logo support, giving the K 1300 GT a far more dynamic appearance.

The inner surfaces of the fairing now fully painted and no longer in the conventional grain touch convey an even higher standard of quality and style. And at the same time the inner surfaces are further upgraded by the instrument panel now finished in a matt, dark metallic colour.

Protectors integrated in the side sections reduce the risk of damage in a fall or accident. Hence, the machine is now well protected should it fall over in an accident or when not properly parked.

New switch and control units.
The new K 1300 GT boasts a brand-new generation of switches and manual controls. Using MID (Moulded Interconnect Devices) technology, the new switch and control units are far smaller and more compact, while at the same time offering a higher standard of functionality, clear design and optimum accessibility. The switches for the electrical adjustable windshield, the handle and seat heating as well as cruise control are all integrated in the control units on the K 1300 GT.

Newly designed instruments.
Like the K 1300 S, the new K 1300 GT comes with a newly designed speedometer and rev counter with an even more dynamic layout on its scale. These two units are supplemented in the digital instrument cluster by the Info-Flatscreen, an information display consistently providing all the information the rider requires on data such as coolant temperature, tank capacity, the time of day, or the gear currently in mesh.

When fitted with ESA II (Electronic Suspension Adjustment II) as an option, the flatscreen provides additional information on the current suspension setting. Other data available on request are the current mileage of the motorcycle, trip mileage and – once the fuel level has dropped to reserve – the remaining range. Any deficiencies or defects, finally, are shown in the display by appropriate signs and symbols.

Electrically adjustable windshield.
The new K 1300 GT comes with the electrically adjustable windshield already featured and proven on the former model, combining optimum protection from wind and weather with minimum dimensions. Through its aerodynamic design and configuration, the windshield guides the wind rushing by round the rider, relieving his head and upper body of wind pressure also at high speeds.

A further important point is that the windshield may be adjusted electrically over a range of 100 millimetres or almost 4 inches from the left handlebar controls, thus consistently meeting the rider's requirements. A higher windshield (+ 60 mm, almost 2.4") is available as an optional extra, offering virtually every rider perfect protection, regardless of his size and riding position, simply by choosing the right windshield and adjusting it accordingly.

Ergonomically designed seat.
To ensure maximum comfort and freedom of movement, the seat, as on the former K 1200 GT, is designed around the so-called step arch length of the rider as the decisive criterion for seating quality. This particular measurement is the distance between the rider's two feet on the ground – measured across the inside of his legs – also taking the shape and the width of the seat into account.

The seat is tapered sign ficantly around the rider, enabling him to comfortably place both feet on the ground and bend his knees just as comfortably.
A further point is that seat height may be adjusted as required to 820 or 840 millimetres (equal to 32.3 or 33.1"). And for the somewhat shorter rider BMW Motorrad offers a lower seat as an optional extra measuring 800 millimetres or 31.5" in height (adjustable to 820 mm or 32.3").

Both with a sporting style of riding and when touring, the "ergonomic triangle" made up of the footrests, the seat and the handlebar guarantees maximum freedom of movement as well as a relaxed style of riding without the slightest fatigue. And last but certainly not least, the passenger will also enjoy the high standard of seat comfort so typical of a BMW.

Handlebar adjustable for height.
As on the K 1200 GT, the handlebar is adjustable for height in four levels, covering a total range of adjustment towards the rider's body of 40 millimetres or almost 1.6", thus adapting to all kinds of riders of different size and allowing the rider to choose his ideal seating position at all times.

The height of the handlebar is adjusted very conveniently and easily through a mechanical thread-and-bolt setting.

3.2 Range of Equipment.

Optional extras and special equipment –
perfect customisation BMW-style.
The new K 1300 GT stands out as a genuine Gran Turismo through its ideal combination of sporting performance and touring comfort provided right from the start even in standard trim. And to raise this standard to an even higher level, BMW Motorrad offers a wide range of optional extras and special equipment optimising this Dynamic Tourer in every respect.

These features will thrill both the demanding Grand Touring rider looking for maximum comfort on long distances and the technology enthusiast in search of innovative technical features. The wide range of functional options extends from an on-board computer through a xenon headlight all the way to the ESA II (Electronic Suspension Adjustment II) suspension allowing the rider though simple and optimum adjustment of the spring and dampers to set the running gear to the rider's current requirements.

Optional extras come straight from the factory and are fitted during production. Special equipment is fitted by the BMW Motorcycle Dealer also subsequently after the motorcycle has been delivered.

Optional extras:
- Heated handles.
- Heated seat.
- Cruise Control.
- ESA II (Electronic Suspension Adjustment II; new).
- Low rider's seat (approx 800 mm/31.5" adjustable to 820 mm or 32.3", step arch length 1,760 mm/68.9").
- High windshield.
- Immobiliser.
- Xenon headlight.

- On-board computer including oil level warning unit.
- ASC Anti-Slip Control.
- TPC Tyre Pressure Control.

Special equipment:
Luggage and storage options:

- Watertight tank rucksack.
- Watertight tank bag including fastening elements.
- Sports softbag, small 19 litres/large 51 litres.
- Watertight luggage roll, 53 litres, including lashing belt with tightening lock.
- Luggage spider.
- Impact protector for system cases, left or right.
- Inner bag for system cases, left or right.
- Topcase, large, in white aluminium, 49 litres including attachments and locking cylinder.
- Topcase, small, 28 litres including attachments and locking cylinder.
- Inner bag for topcase, large/small.
- Back padding for topcase, small.

Maintenance and technical features:

- On-board toolkit/service kit.
- Paddock stand including adapter.
- 230 V/110 V battery charger including adapter.
- Repair kit for tubeless tyres.
- Repair instructions for K-models, DVD.
- Motorcycle cleaner.

- Additional power socket.

- LED light for on-board socket.

Ergonomics and comfort:

- Heated handles with control unit.

- Low rider's seat (approx 800 mm/31.5" adjustable to 820 mm or 32.3", step arch length 1,760 mm/68.9").

- Windshield, large.

- Windshield, tinted.

Safety and security:

- Immobiliser with remote control.

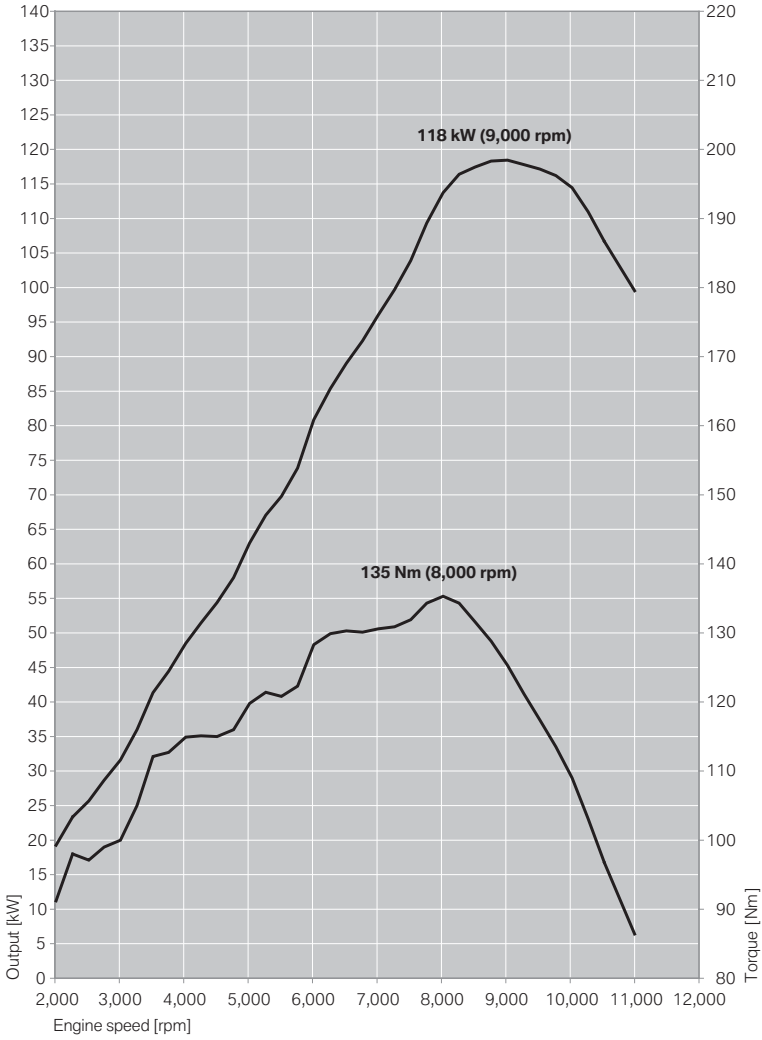
- First-aid kit, large/small.

- Motorcycle cover.

Navigation and communication:

- BMW Motorrad ZUMO navigation and communication unit incl holder (new).

3.3 Engine Output and Torque. BMW K 1300 GT.



3.4 Specifications. BMW K 1300 GT.

Power Unit	
Configuration	Water-cooled four-stroke straight-four, two camshafts, four valves per cylinder
Bore x stroke	80 mm x 64.3 mm (3.15" x 2.53")
Capacity	1,293 cc
Max output	118 KW (160 hp) at 9,000 rpm
Max torque	135 Nm (99 lb-ft) at 8,000 rpm
Compression ratio	13.0 : 1
Fuel supply/ engine management	Electronic fuel injection, Digital Motor Electronics with integrated knock control (BMS-K)
Valve/gas control	DOHC (double overhead camshaft)
Diameter inlet	32
Diameter outlet	27,5
Throttle valve diameter	46
Exhaust management	Fully controlled three-way catalytic converter, EU3 emission standard
Performance/ Fuel Consumption	
Top speed	200 km/h (124 mph) plus
Fuel consumption/100 km at a steady 90 km/h (56 mph)	5.0 ltr (56.5 mpg imp)
Fuel consumption/100 km at a steady 120 km/h (75 mph)	5.9 ltr (47.9 mpg imp)
Fuel grade	Premium plus, unleaded, 98 RON; use of premium down to 95 RON possible thanks to automatic knock control
Electrical System	
Alternator	945 W three-phase alternator
Battery	12 V/19 Ah, maintenance-free
Power Transmission	
Clutch	Multiple-plate clutch in oil bath, hydraulically operated
Gearbox	Dog-shift six-speed gearbox
Primary Transmission	1,559
Transmission, gear stages	
I	2,398
II	1,87
III	1,525
IV	1,296
V	1,143
VI	1,015
Secondary drive	Drive shaft

Suspension/Brakes	
Frame	Bridge frame made of aluminium, engine load-bearing
Front wheel guidance/ spring elements	BMW Motorrad Duolever; central spring strut
Rear wheel guidance/ spring elements	Cast aluminium single swing arm with BMW Motorrad Paralever; central spring strut with levelling system, spring pre-tension with infinite hydraulic adjustment by hand wheel, rebound damping adjustable
Suspension/Brakes	
Spring travel, front/rear	115 mm/135 mm (4.52/5.31")
Wheelbase	1,572 mm (61.9")
Castor	112 mm (44.1")
Steering head angle	60.6°
Wheels	Cast aluminium
Rim, front	3.50 x 17"
Rim, rear	5.50 x 17"
Tyre, front	120/70 ZR 17
Tyre, rear	180/55 ZR 17
Brake, front	Double-disc brake, brake discs in floating arrangement, diameter 320 mm (12.6"), four-piston fixed calliper
Brake, rear	Single-disc brake, diameter 294 mm (11.6"), double-piston floating callipers
ABS	Standard: BMW Motorrad Integral ABS (semi-integral)
Weight/Dimension	
Seat height	820/840 mm (32.3/33.1") (low seat: 800/820 mm (31.5"/32.3"))
Step arch length	1,800/1,840 mm (70.9/72.4") (low seat: 1,760/ 1,800 mm (68.9"/70.9"))
Unladen weight in road trim and with full tank	288 kg (635 lb)
Dry weight	255 kg (562 lb)
Max permissible	520 kg (1,147 lb)
Max load (in standard trim)	232 kg (512 lb)
Useful tank capacity	24 ltr (5.3 imp gals)
Thereof reserve	approx 4.0 ltr (0.9 imp gals)
Length	2,318 mm (91.3")
Height (without mirrors)	1,438 mm (56.6")
Width (on mirrors)	965 mm (38.0") (measured with cases: 990 mm/38.9")

3.5 The K 1300 GT Colour Range.

The new K 1300 GT offers perfect harmony of touring qualities and sporting riding dynamics – features also reflected by the design of the K 1300 GT with its flowing lines and clear, striking shapes and surfaces. The lines tapering out towards the front symbolise even more power and dynamics than before, combined with sporting and slender all-round proportions.

The three main colours available for the body are Red Apple Metallic, Royal Blue Metallic, and Magnesium Beige Metallic, contrasting perfectly with the drivetrain finished in Black and the suspension components in Asphalt Metallic.

While Red Apple Metallic in conjunction with dark contrasting components on the spoiler and at the rear appeals particularly to the sporting and ambitious rider, the experienced touring rider will definitely enjoy Royal Blue Metallic with White Aluminium contrasting components as a puristic alternative.

A third variant offers an even higher level of elegance and modern style: Magnesium Beige Metallic contrasting with Dark Slate Metallic, matt.

4. 25 Years of BMW K-Series.
4.1 The Inline-Engine BMW.

Back in 1983, when many motorcycle manufacturers still placed their bets on inline engines with air cooling, liquid-cooled four-cylinder power units marked the highest level of technology in motorcycle construction. But instead of resorting to the usual engine layouts, BMW engineers Josef Fritzenwenger and Stefan Pachernegg succeeded in developing a brand-new future-oriented technical concept subsequently enhanced all the way to regular production quality.

In the process they maintained the longitudinal position of the crankshaft typical up to that time of BMW motorcycles with a direct flow of power from the gearbox through the drive shaft to the rear wheel, referred to under the official term as the BMW Compact Drive System. A brand-new approach, on the other hand, was the introduction of liquid cooling.

Displacing 987 cc, the straight-four power unit is fitted in longitudinal, flat configuration. The crankshaft is on the right-hand side seen in the direction of travel, while the cylinder head with the two overhead camshaft is on the left.

Liquid cooling comes for the first time on this new BMW, ensuring not only supreme thermal stability, but also, through efficient soundproofing, a very low level of mechanical noise.

Two other innovations likewise characterised the new engine: First, electronic fuel injection supplying fuel to the combustion chambers. Second, the layout of the engine as a load-bearing element fully integrated in the light and torsionally stiff tubular steel spaceframe.

This principle sets the foundation for the BMW K-Series motorcycles. So regardless of whether they are Sports Machines, Tourers or Naked Bikes – the K-Series proves to be extremely innovative and versatile in technical terms and virtually every other respect. To this day, the concept of the straight-four fitted lengthwise remains within the BMW Motorrad model range in the guise of the K 1200 LT Luxury Tourer.

Ongoing development of the K-Series also provides important momentum for a brand-new technical approach. In 2004, for example, the first BMW K Series with its four-cylinder engine fitted crosswise sees the light of day – the K 1200 S as the most powerful and fastest BMW of all times.

Just how much development margin and what a great potential this new concept offers in the K-Series is subsequently borne out not only by the new K 1200 R High-Performance Roadster based on the new sports model, but also by the K 1200 GT High Performance Tourer.

Increasing engine size on these models and introducing new, innovative solutions, BMW Motorrad is now opening up another, definitely equally successful chapter in the history of the Company's K models.

4.2 The Two-Valve Models as of 1983.

K 100 (1983–1990).
The K 100 launched in 1983 – exactly six decades after the launch of the very first BMW motorcycle with its Boxer engine – is BMW's first production model with a four-cylinder power unit. But instead of following the usual Japanese concept with the straight-four engine fitted crosswise, BMW once again takes a new and unusual approach: Featuring liquid-cooling and not air-cooling like most other production motorcycles, the four-cylinder power unit is fitted flat in longitudinal direction as a load-bearing element in the tubular steel spaceframe, with the transmission of power from the gearbox to the rear wheel remaining in a technology so typical and well-proven at BMW: through a drive shaft.

The K 100 is one of the first production motorcycles in the world to feature fuel injection (Bosch LE-Jetronic) supplying the fuel/air mixture to the 987-cc four-cylinder with two valve-operated cup tappets per cylinder.

Two other innovations in the production of BMW series machines are the two overhead camshafts as well as the Monolever single-swing arm on these dynamic 1000-cc models.

BMW's first-ever four-cylinder is upgraded in 1987, a free-standing headlight taking the place of the former headlight/instrument unit, a black-painted engine and painted rims as well as a dynamically style fuel tank/seat combination marking the most important differences.

As before, engine output is 90 hp at 8,000 rpm.

K 100 RS (1983–1989).
Introducing the K 100 RS, BMW adds a sports model to the existing range with the same engine and suspension technology, but now featuring a carefully designed aerodynamic fairing. The handlebar fitted lower down provides a more sporting seat position, the fairing carefully developed in the wind tunnel, together with its adjustable wind deflector and the direction indicators integrated in the rear mirrors, combining a sporting look for high speeds with all the grand touring comfort so typical of a BMW.

For a long time the K 100 RS remains the ideal synthesis of sportiness and touring comfort and, with a production run of more than 34,000 units, becomes the best-selling model in the first generation of the K-Series.

BMW offers the K 100 RS as well as the other four-cylinder models in the K-Series as of 1988 with ABS as a special feature, thus taking on the leading role in introducing this technology in the motorcycle world.

K 100 RT (1984–1989).
In 1984 BMW Motorrad launches the ultimate Grand Touring Machine, the K 100 RT based on the K 100 RS. Featuring the same engine and suspension technology as the RS, this new model combines a sporting and dynamic style of riding with perfect protection from wind and weather on long distances provided by the higher and wider full fairing. The comfortable seating position enjoyed by both the rider and pillion as well as a wide range of BMW options and special equipment comprising, for example, baggage cases, a tank rucksack or heated handles, quickly make the K 100 RT the benchmark in its segment.

K 100 LT (1986–1991).
In 1986 BMW launches a luxury version of the successful K 100 RT, the new K 100 LT. The response to this Grand Touring machine also featuring a generously upholstered comfort seat, a radio, topcase and special paintwork is so overwhelming that the K 100 LT soon outsells the K 100 RT “basic” model in the market.

The new machine leaves virtually nothing to be desired in terms of comfort and features, making this Luxury Tourer the role model for a whole new generation of extravagant touring machines.

K 75 C/K 75 (1985 – 1996).
Two years after the launch of the K-Series with its four-cylinder power unit, BMW broadens the new product line through the introduction of the K 75 C with a straight-three engine. While the suspension and running gear is based almost entirely on the innovative technology of the large four-cylinder, the 740-cc power unit is a brand-new construction nevertheless following the basic layout of the four-cylinder very closely indeed.

Again fitted lengthwise and in flat arrangement as a load-bearing element in the spaceframe, this liquid-cooled three-cylinder with 67 millimetres/2.63“ cylinder bore and 70 millimetres/2.76“ stroke comes with the same basic spec fications as the larger K 100.

The drive shaft positioned beneath the crankshaft gives the three-cylinder particular smoothness and refinement also thanks to the balance weights used on the shaft. Developing maximum output of 75 hp on total weight with a full tank of 227 kg/501 lb, the K 75 C stands out above all as a particularly agile motorcycle for country roads, without requiring the rider to give up the grand touring comfort so typical of a BMW.

Just one year after the launch of the K 75, the customer is given the choice of a new alternative, the K 75 C with its cockpit fairing fitted firmly to the handlebar. Now the headlight and instruments are now longer integrated in the cockpit fairing, but rather stand out freely on the machine, with the rear drum brake in combination with the 18-inch rear wheel being replaced as of 1990 by a disc brake and a 17-inch rear wheel.

The engine finished in black and the dynamically designed fuel tank/seat combination serve to further upgrade the K 75. Accounting for approximately 28,000 units, the two “basic” versions of the K 75 become the most successful representatives of their model series.

K 75 S (1985–1995).
Introducing the K 75 S, BMW adds a sporting sister model to the K 75 C. While the suspension and drivetrain are based on the innovative technology of the K 75 C, the slender semi-shell bearing fitted firmly to the frame clearly reveals the sporting character of the motorcycle right from the beginning.

The K 75 S therefore also comes with a firmer spring/damper set-up featuring shorter spring travel and a 17-inch rear wheel with a disc brake instead of the full-hub drum brake on the basic model.

The K 75 S Special launched in 1986 boasts an engine spoiler introduced as a standard feature in 1988.

As of 1990 the K 75 S, like all other three-cylinders, is likewise available with ABS. And starting in the 1991 model year, three-spoke light-alloy wheels take the place of the eight-spoke cast wheels used so far.

K 75 RT (1989–1996).
In 1989 BMW carries over the successful concept of the K 100 RT to the three-cylinder model series, thus creating the K 75 RT. On this new model the sophisticated aerodynamic full fairing offers outstanding protection from wind and weather on long distances, while the wide range of optional extras and special equipment so typical of BMW leaves nothing to be desired also on the Tourer with its three-cylinder power unit.

On 18 March 1991 a K 75 RT comes off the production lines at BMW as the one-millionth model built by BMW Motorrad.

Introducing two special models, the K 75 RT Ultima and the K 75 Ultima, each in special paintwork, with ABS, a catalytic converter and case holders, BMW finally ceases production of the three-cylinder model series in summer 1996 after a total production volume of the K 75 amounting to 68, 011 units.

4.3 The First-Generation Four-Valve Models.

K1 (1988–1993).
In 1988 the K1 sets another milestone in the history of the BMW K-Series. Apart from its brand-new design and aerodynamics concept remaining unique in the motorcycle world to this day, the K1 is BMW's first production motorcycle with four-valve technology, small valve angles, and extremely advanced design of the combustion chambers.

The greater cylinder charge achieved in this way is reflected by the extra power of the engine, the K1 developing maximum output of 100 hp at 8, 000 rpm – more than any other BMW before.

Featuring new Bosch Motronic fuel injection, 17-inch wheels and ABS, the K1 also sets new highlights in technology, one example being the Paralever double-joint rear wheel swing arm introduced a year before on the R 100 GS and effectively preventing drive forces from the drive shaft and any undesired effects of this kind on the rear-wheel suspension.

The K1 is also the world's first production machine to feature a fully-controlled three-way catalytic converter, making a significant contribution to environmental protection and subsequently introduced step-by-step on all BMW motorcycles as of 1991.

Production of the K1 ends in 1993 with the special Ultima model.

K 100 RS (1989–1992).
The innovative four-valve technology introduced on the K1 with its engine output of 100 hp makes its way back into the market in 1989 in the highly successful K 100 RS. While the combination of the fuel tank and seat as well as the fairing with direction indicators integrated in the rear-view mirrors corresponds to the former model, the new K 100 RS, like the K1, benefits form new 17-inch wheels, larger brakes, and the Paralever single-swing arm at the rear.

K 1100 LT (1991–1999).
In 1991 BMW presents yet another milestone in the history of the K-Series through the introduction of the K 1100 LT, the first BMW to displace more than 1,000 cc: an increase in cylinder bore from 67 to 70.5 millimetres (2.63 to 2.78") gives the engine 105 cc more capacity, the upgraded K

four-cylinder developing maximum output of 100 hp from 1,092 cc at an engine speed of only 7,500 rpm.

A factor far more important on the road than the increase in maximum output by 10 hp over the former model is the sign ficant increase in torque. Offering a lot more traction and pulling power, the K 1100 LT is even more superior on the road and for a long time represents the topmost level in the Luxury Tourer market. This is also borne out clearly by the fundamentally upgraded suspension with its Paralever single-swing arm effectively keeping out any undesired disturbance from the drivetrain and thus ensuring even greater comfort and riding smoothness.

Another important feature offered by the K 1100 LT for the first time is the electrically adjustable windshield. Newly developed cases and a special topcase, finally, round off the well-conceived range of touring features again so typical of BMW.

Launching the K 1100 LT Highline in 1997, BMW Motorrad introduces a special model highlighting the luxurious claim of this supreme Tourer by sophisticated chrome components and equally outstanding special paintwork.

K 1100 RS (1992–1996).
Just one year after introduction of the large four-cylinder in the K 1100 LT, the same 100-hp power unit is featured in the LT's sporting sister model, the K 1100 RS. The newly designed fairing with its lower section encompassing the engine ensures even better aerodynamic qualities and once again optimises the protection of wind and weather so typical of BMW.

A new Marzocchi telescopic fork as well as the firmer suspension set-up gives this sporting all-rounder even greater dynamic qualities.

A particularly sophisticated special model, the K 1100 RS with its polished immersion tube, black-painted tank and upper fairing, as well as distinctive elements finished in silver such as the cooling air intake, the lower section of the fairing and the rear fairing, give this special model a very particular touch.

K 1200 RS (1996–2005).
The K 1200 RS launched in autumn 1996 takes yet another step in terms of engine size and driving dynamics. A new crankshaft now offering 75 instead of 70 millimetres (2.95 instead of 2.75") stroke increases engine capacity by exactly 79 cc to 1,171 cc, with power up from 100 to 130 hp at 8,750 rpm.

The new six-speed gearbox ensures even more dynamic performance and the brand-new suspension clearly reflects the sporting style of this new top-end model.

For the first time the K 1200 RS features a light-alloy bridge frame integrating the four-cylinder power unit no longer as a load-bearing element, but rather as a detached unit not conveying any vibration to the machine.

The K 1200 RS is the first model in the K-Series to feature the unique front-wheel Telelever originally introduced on the R 1100 RS in 1993. Individual ergonomic preferences, finally, are taken into account by the option to adjust the handlebar, the windshield, the footrests and the seat (for height).

K 1200 LT (1998–2008).
Two years after the introduction of the K 1200 RS, BMW presents a particularly luxurious Tourer in the guise of the K 1200 LT, leaving all conventional standards and models far behind. Based on the suspension and engine technology of the K 1200 RS, the K 1200 LT also features a new light-alloy bridge frame as well as an increase in capacity to 1,171 cc.

Offering maximum output of 98 hp at just 6,750 rpm and peak torque of 115 Newton-metres (85 lb-ft) at a low 4,750 rpm, the K 1200 LT is designed less for peak performance than rather for supreme torque and pulling power. Hence, it only needs a five-speed gearbox for superior touring in genuine style.

Apart from the full fairing offering perfect protection from wind and weather, as well as cases integrated in the overall design and layout of the machine and a topcase offering a total capacity of 120 litres, the K 1200 LT, with its HiFi player, on-board computer, cruise control, heated handles and optionally heated seat offers touring comfort of a standard never seen before.

This wide range of equipment explains the sign ficant overall weight of 378 kg or 833 lb, which BMW also takes into account by adding a reverse gear for practical manoeuvring activated electrically by the starter motor.

The K 1200 LT is further upgraded in the 2004 model year, now benefiting from an even more powerful engine with 116 hp and 120 Newton-metres (88 lb-ft) maximum torque, an electrohydraulically activated main stand and a rear spring element with travel-dependent damping.

To this day, the K 1200 Lt comes right at the top of this market segment.

K 1200 GT (2002–2005).
The K 1200 GT makes its debut in 2002 as an enhanced variant of the K 1200 RS giving even greater emphasis to touring comfort. Boasting 130 hp maximum output, featuring a higher windshield and handlebar, optimised seating comfort and a case system fitted as standard, the K 1200 GT is even more of a genuine Gran Turismo, redefining the synthesis of sporting riding dynamics and supreme touring comfort in BMW's usual style and quality. The outstanding aerodynamic benefits offered by the full fairing ensure not only optimum protection from wind and weather, but also, in conjunction with a powerful engine, guarantee high average speeds on long distances.

4.4 The Second-Generation of Four-Cylinders.

K 1200 S (2004–2008).
The K 1200 S makes its entry into the market in 2004 as a radically new and highly innovative Sports Machine standing out as a unique model within the K-family. With its brand-new straight-four now fitted crosswise and displacing 1,157 cc, the K 1200 S has no predecessor and no role model in the history of BMW Motorrad, but is rather brand-new in every respect.

The technical highlights of this 167-hp Sports Machine are the very sloped angle of the cylinder bank tilted 55o to the front to provide a low centre of gravity as well as innovative suspension technology with the BMW EVO Paralever and the BMW Duolever at the front. On the BMW Duolever, the square set-up of arms consisting of two longitudinal arms pivoting within the frame guides the wheel bearings and thus allows appropriate wheel travel.

The K 1200 S combines supreme riding precision and agility with a standard of engine power and riding performance that leaves nothing to be desired. As an option BMW even offers ESA (Electronic Suspension Adjustment) on the K 1200 S for the first time in series production, electronically controlled suspension operated at the touch of a button. This allows the rider to adjust the suspension and damping individually to his personal style and the load the machine is carrying.

K 1200 R (2004–2008).
Launching the high-performance K 1200 R Roadster, BMW enters the segment of high-power Naked Bikes for the first time in 2004. Based on the K 1200 S, the new K 1200 R benefits from the straight-four engine with dry sump lubrication as well as innovative suspension technology with the BMW Duolever at the front and the BMW EVO Paralever at the rear.

Developing 163 hp at 10, 250 rpm, the K 1200 R is almost as powerful as the sports model with its special fairing, immediately moving to the top in the Naked Bikes segment.

The new Roadster also bears out its superior performance through the special look of this new machine. Special body elements around the tank and rear end as well as the striking dual headlight with its surface finished in matt chrome

stand out particularly. Only a small windshield covers the front area above the headlight, but still offers efficient protection from the wind rushing by despite its small size.

Fitted with racing tyres, carbon trim and other motorsport components, the K 1200 R hits the headlines in the BMW Motorrad Power Cup held on the occasion of the MotoGP races in 2005.

K 1200 GT (2006–2008).
Following the success of its predecessor of the same name, the K 1200 GT opens up new dimension in riding dynamics and long-distance touring in 2006, combining maximum agility and dynamics in an overall package equally well suited for superior touring. To reach this objective the development engineers at BMW Motorrad carry over the trendsetting suspension and engine technology of the K 1200 S into this new Sports Tourer, the innovative wheel guidance components – the Duolever and the EVO Paralever at the rear – making a significant contribution to the very dynamic riding qualities of the K 1200 GT.

The new machine is powered by BMW Motorrad's ultra-modern straight-four power unit fitted crosswise in the machine and developing 152 hp in the GT version, setting the benchmark in the Tourer segment at the time. Indeed, no other manufacturer in the market emphasises dynamic performance more than BMW with the new K 1200 GT.

A comparison with the former model also reveals the most significant improvements offered by the new machine: the new K 1200 GT is more powerful (output + 17%), develops more torque (+ 11%), offers a longer theoretical range (+ 17%) and, at the same time, is lighter (– 6%), but is nevertheless able to carry a higher load (+ 19%).

K 1200 R Sport (2007–2008).
With its semi-fairing bolted firmly on to the frame, the headlight unit carried over from the R 1200 S and its handlebar detached to prevent the transmission of vibrations, the K 1200 R Sport from BMW Motorrad is positioned between the naked K 1200 R and the fully-fairing K 1200 S.

In the style of a genuine Naked Bike, the K 1200 R Sport offers a free view of the impressive suspension and engine components. And at the same time the range of practical use provided by the new machine is much larger than before, significantly better wind protection allowing the rider to cover longer distances at a high speed, while the upright seating position and the wide handlebar guarantee maximum agility on sporting country roads and tours.