90 years of BMW Motorrad.
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1. A passion for innovation and dynamics breeds riding pleasure. 90 years of BMW Motorrad.

For nine decades the BMW brand has played a defining role in the development of personal mobility on two wheels. Over this time, a talent for innovation, success in motor sport competition, outstanding quality standards and distinctive design have earned BMW Motorrad the status it enjoys today. The founding fathers of this successful heritage are BMW motorcycles which demonstrated their functional efficiency and reliability – both in the sporting arena and the "real world" of day-to-day riding – to fulfil a basic need for independent travel. Over the decades, however, the pure pleasure of motorcycle riding has steadily grown in importance. Indeed, captivating technology and the experience of freedom continue to fuel the ever-increasing popularity of the BMW Motorrad brand around the world today.

90 years on from the presentation of the first ever BMW motorcycle, fresh challenges have come to the fore, particularly where urban mobility is concerned. BMW Motorrad has focused its attention on a range of issues – the importance of reducing emissions and making more efficient use of traffic space among the most important – notably through concepts with all-electric drive systems (and therefore zero local emissions). These machines open a window into riding pleasure powered by sustainable drivetrain technology and provide another example of how BMW Motorrad has channelled its passion for innovation and dynamics into the service of personal mobility.

A boxer-powered premiere: the BMW R 32.

28 September 1923 marked not only the opening day of the Berlin Motor Show, but also the beginning of motorcycle construction at BMW – with the public unveiling of the BMW R 32. This was a motorcycle whose essential drive concept – an air-cooled twin-cylinder four-stroke boxer engine with cylinders mounted horizontally to the direction of travel, manual gearbox driven directly by a friction clutch and shaft drive – is applied to numerous BMW models to this day.

The BMW R 32 was developed within the space of a few weeks by Technical Director Max Friz and his team. Up to that point BMW had concentrated on aero, marine and truck engines. The fledgling company had, however, also been building boxer engines for third-party motorcycle manufacturers since 1920, which made the development of a BMW brand motorcycle a logical next step. Proof that the necessary development expertise was available in-house came in the form of the BMW R 32, which was powered by a 494cc

engine producing 6.25 kW/8.5 hp and offered surefooted handling, outstanding performance and impressive reliability. By contrast with its rivals, which were largely based on bicycle geometry, the BMW R 32 was conceived as a standalone machine and boasted a level of quality no competitor could match. As a result, the essentially fairly modest BMW R 32 was positioned as a premium model.

A quick sprint to sporting glory.

From the very outset, motor racing played a significant role as a motivating factor and source of inspiration in the development of BMW motorcycles. Success was quick to arrive, courtesy of the BMW R 32 itself. And further down the line, the BMW R 37 presented in 1924 was the first motorcycle anywhere to be powered by an engine with light-alloy cylinder heads. The higher output of these engines gave the riders an extra edge in the sporting arena. At the same time, BMW was developing its first single-cylinder model, and Josef Stelzer wasted no time in riding the BMW R 39 (247cc, 5 kW/6.5 hp) to victory in the quarter-litre class of the 1925 German championship. In addition, BMW won the national 500cc championship title in 1924 and again in an uninterrupted reign from 1926 to 1929.

This sustained period of success in race competition went hand-in-hand with a rise to new levels in sales figures for BMW motorcycles. Between the first full year of production in 1924 and 1929, the number of units delivered to customers rose from 1,640 to 5,680.

Innovations and speed records.

The innovative excellence of the BMW motorcycle developers continued to breed success on the race track and road over the years that followed. The 750cc boxer-engined BMW R 12 and BMW R 17 presented in 1934 revealed a revolutionary new development making its international debut on a series-produced motorcycle: a hydraulically damped telescopic fork for the front wheel suspension. These two new models also heralded the arrival of half-hub brakes integrated into the rear wheel and a pressed-steel frame. The latter gave the bikes a powerful appearance – subsequently credited with inspiring the “German school” of motorcycle engineering – and enhanced stability. The BMW R 17 was the most striking beneficiary, its 24 kW/33 hp and 140 km/h (87 mph) top speed elevating it to the ranks of the fastest and most powerful series-produced motorcycles of its day.

BMW also maintained its success of those early years in the 500cc class and with single-cylinder motorcycles. Machines like the BMW R 2, BMW R 35 and 500cc BMW R 5 – which featured a steel tubular frame and a telescopic fork allowing adjustable damping – were indicative of the company’s technical

advances. Further evidence came in 1938 with the arrival of the BMW R 51, the first BMW motorcycle to come with a plunger suspension construction for the rear wheel that offered exceptional levels of comfort.

As BMW's motorcycle model range expanded, so its racing activities on two wheels grew increasingly diverse. Ernst Henne won the German championship in 1926 and the Targa Florio in 1928, and was a member of the BMW team that topped the nations' standings in the International Six Days Trial off-road competition every year between 1933 and 1935. To those achievements he could also add a succession of record-breaking exploits which rendered the motorcycle community pleasantly astonished. Henne's 216.75 km/h (134.67 mph) in 1929 was the first of 76 speed world records set by the German on BMW motorcycles. In 1937 he pushed the figure up to 279.5 km/h (173.7 mph) on a supercharged, full-fairing 500cc BMW – a record that would last for 14 years. Georg "Schorsch" Meier, meanwhile, was crowned both German and European champion in 1938 in the half-litre class, and the following year became the first rider from outside the British Isles to win the Senior TT on the Isle of Man on board a BMW supercharged "Kompressor" model.

Production numbers for BMW motorcycles also reached new heights during this period, easing past the 100,000 mark before the outbreak of the Second World War.

Starting again with 12 hp: the BMW R 24.

With motorcycle production in Germany devoted almost entirely to the requirements of the military in the first half of the 1940s, the industry was left to start again from square one – in terms of both development and production – once hostilities had ceased. In 1948, for example, production began of the single-cylinder BMW R 24 at the BMW Motorrad plant in Munich. Based on the pre-war BMW R 23 and developing output of 9 kW/12 hp, it heralded the dawn of a much-needed new era in personal mobility.

In 1950 production began again of a BMW motorcycle powered by a twin-cylinder boxer engine. The BMW R 51/2 was likewise designed on the basis of a pre-war model. However, as sales figures climbed, the engineers began to enjoy greater licence to innovate. A new generation of engines was introduced with the BMW R 51/3 in 1951. The following year saw the debut of the BMW R 68 which, with a 600cc two-cylinder engine developing 26 kW/35 hp, was Germany's first production motorcycle capable of 160 km/h (99 mph). The pace was getting even hotter in the sporting arena; for the BMW RS 54 introduced in 1954, the BMW engineers had developed a boxer engine with two vertical shaft-driven overhead camshafts, which

delivered 33 kW/45 hp and accelerated this race-spec machine – which was also on general sale – to the verge of 200 km/h (124 mph).

World champion in 1954 and almost unbeatable up to 1974 – in sidecar racing.

Germany's post-war "economic miracle" saw annual production at BMW top 30,000 motorcycles for the first time in 1954. And the brand started making waves again in race competition, too. "Schorsch" Meier had already picked up another a national championship title in 1947, and in 1956 Walter Zeller was the world championship runner-up on a 500cc BMW RS race machine. Even more striking, however, was the brand's run of success in sidecar racing, starting with Wilhelm Noll and Fritz Cron's 1954 world championship triumph. In the years up to 1974, BMW amassed no fewer than 19 riders' and 20 manufacturers' world titles.

The racing motorcycles' combination of a long swing arm for the front wheel and a swing arm at the rear was adopted by series-produced models from 1955. The 500cc BMW R 50, 600cc BMW R 60 and BMW R 69, and – from 1956 – the single-cylinder BMW R 26 utilised full swing-arm suspension to set a new benchmark in terms of comfort and directional stability.

With their revised engines and stronger frame construction, the BMW R 50/2 and BMW R 60/2 boxer models introduced in 1960 represented evolutionary further developments of their respective predecessors. Plus, the brand's sporting profile was given a sharper edge by the BMW R 50 S and BMW R 69 S models, which offered not only more power but also hydraulic steering dampers. Comfort levels, meanwhile, were given a notable boost by the jettisoning of the sprung saddle in favour of the now obligatory bench seat. The BMW R 69 S, in particular, demonstrated its qualities with a string of successes in endurance racing. The single-cylinder BMW R 27 developed more power than the BMW R 26 and featured rubber mounts for the engine and gearbox, which minimised vibrations.

1969: BMW starts up motorcycle production in Berlin-Spandau.

As Germany's economic growth picked up an increasingly potent head of steam during the 1950s, so a fundamental shift in the nature of personal mobility set in. For BMW, this development had two main consequences. As the car industry revelled in an extraordinary boom, demand for motorcycles was falling away dramatically. Customers had reassessed their priorities, and BMW followed suit in many areas. The company pulled the plug on production of its single-cylinder models in 1966 and initiated a phased relocation of its motorcycle manufacturing operations to Berlin-Spandau. Only

the development and testing departments were left behind in Munich, where they remain today.

The start of motorcycle production in Berlin-Spandau also marked the launch of an all-new range of models. In autumn 1969 BMW Motorrad unveiled the first models in its /5 series: the BMW R 50/5 with 24 kW/32 hp, BMW R 60/5 with 29 kW/40 hp and BMW R 75/5 developing 37 kW/50 hp all offered impressive power delivery and easy handling. Features such as a single-piece forged crankshaft, light-alloy cylinders with cast cylinder liners, double-bolted cylinder heads and a constant velocity carburettor for the 175 km/h (109 mph) top-of-the-line model provided clear evidence of technical progress at work. Meanwhile, the new steel double-cradle frame, a rear swing arm with oil pressure shock absorbers and a hydraulically damped telescopic fork made a significant contribution to the ride comfort and safety that enshrined the trio as standard-bearers for a new generation of sporty touring motorcycles. The flagship model was received particularly enthusiastically. Indeed, by 1973 BMW had sold over 38,000 units of its first post-war 750cc motorcycle. For the first time, the most powerful variant of a BMW Motorrad model series was also the best selling.

An anniversary, innovative bike concepts and a new heyday for BMW motorcycles.

A new page had been turned in the history of motorcycling, and the pleasure of motoring on two wheels was now proving to be an increasingly popular leisure time attraction. In 1971 a total of 18,000 BMW motorcycles rolled off the assembly line in Berlin. And in 1973, production of the brand's 500,000th two-wheeler lent an extra lustre to the celebrations marking 50 years of BMW Motorrad.

Innovative motorcycle concepts, technological further developments and a single-minded focus on sports performance defined BMW Motorrad's model strategy during the 1970s. The 50th anniversary year also saw BMW introduce its /6 series, in the shape of the BMW R 60/6, BMW R 75/6 and BMW R 90/6 models. New instruments with separate dials to show speed and revs, a five-speed gearbox and hydraulic brakes with perforated discs at the front wheel provided evidence of the advances made in the name of comfort and safety. The sporting highlight of the line-up was the BMW R 90 S, whose 900cc engine with large Dell'Orto carburettors developed 49 kW/67 hp and powered the new top-of-the-line model to a maximum 200 km/h (124 mph). Plus, the BMW R 90 S was the first series-produced motorcycle to come with a fairing fixed to the handlebars. This made it an instant hit among performance-minded customers and a contender for glory on the race track. Hans-Otto Butenuth and Helmut Dähne rode the BMW

R 90 S to a class win in the 1976 Production TT, Steve McLaughlin celebrated victory in the Daytona 200 on the same machine, and his team-mate Reg Pridmore was crowned US superbike champion the same year.

Revolution in the wind tunnel: the BMW R 100 RS is the first motorcycle with an aerodynamically optimised full fairing.

BMW AG began 1976 with a restructuring of its motorcycle activities, the creation of BMW Motorrad GmbH giving BMW's motorcycle wing a standalone corporate identity. One of its first moves as a wholly-owned subsidiary of BMW AG was to continue its overall model push with a foray into the one-litre class. The new BMW R 100/7 and BMW R 100 S were powered by a boxer engine with 980cc capacity, but it was the BMW R 100 RS which turned most heads. This was the world's first series-produced motorcycle whose rider sat behind a full fairing developed in the wind tunnel. Fixed to the frame, the fairing not only offered protection from the wind and wet, but also allowed the rider to travel long distances at high speeds in an upright position. The bike underlined its unique qualities with world record runs on the Nardo circuit in Italy. Output of 51 kW/70 hp and exceptional aerodynamics enabled the BMW R 100 RS to hit a top speed of 200 km/h (124 mph) on the road as well as the track. And in the first ever readers' poll carried out by "Das Motorrad" bike magazine, it was voted "Motorcycle of the Year".

The BMW R 100 RT launched in 1978 took the new concept to its logical next stage. Its full fairing was adapted to deliver even greater comfort while a bespoke luggage system was also offered, making the BMW R 100 RT the ideal motorcycle for discerning touring riders. That same year, BMW Motorrad presented a second boxer range, the light and easy-handling BMW R 45 (473cc, 26 kW/35 hp) and BMW R 65 (649cc, 33 kW/45 hp) models appealing to whole new target groups. The BMW R 45 – whose engine could be detuned to 20 kW/27 hp to ensure a particularly favourable insurance rating – was especially successful in opening up the pleasure of motorcycle riding to rookie bikers.

The BMW R 80 G/S: victory in the Paris-Dakar Rally, success in a new market segment.

BMW harked back to its early successes in off-road competition with victory in the 1980 European championship. The motorcycle Rolf Witthöft rode to the title soon found its way to dealers in a series-produced version. The BMW R 80 G/S, powered by a 797cc boxer engine developing 37 kW/50 hp, took the brand into a new segment and boasted eye-catching technical highlights such as the Monolever single-sided swing arm for the rear wheel with spring strut mounted on one. Indeed, it paved the way for an all-new breed of touring enduro bikes. The G/S badge – later written without the slash – stood for

"Gelände/Straße" (off-road/on-road), and it was as good as its word. The off-road qualities of the lightweight BMW R 80 G/S (it weighed just 183 kilograms) were beyond dispute, especially after it had whisked Frenchman Hubert Auriol (in 1981 and 1983) and Belgian rider Gaston Rahier (1984 and 1985) to multiple victories in the Paris-Dakar Rally. However, perhaps even more impressive was its surefooted and agile manners with asphalt under its wheels rather than stones and sand.

Coup with a K: longitudinal four-cylinder celebrates its premiere.
The powertrain engineers at BMW Motorrad had another sensation up their sleeves in 1983; for the first time in the company's history they fitted a BMW motorcycle with a four-cylinder engine. And that wasn't all. The 987cc unit, producing 66 kW/90 hp, was positioned longitudinally and as a stressed member in the new BMW K 100's steel space frame, which was open at its lower edge. Overhead camshafts and fuel injection were among other key features. All in all, the BMW engine builders had staged a highly successful coup. A full model series soon took shape in the form of the BMW K 100 RS, BMW K 100 RT and BMW K 100 LT, and by the end of 1984 more than 30,000 units had already been sold. Added to which, the BMW K 100 was the world's first series-produced motorcycle to be available with anti-lock brakes; it was in this model in 1988 that the ABS system developed specially for use in motorcycles set out on its triumphant path.

From the moment they began work on the longitudinally mounted engine, the engineers always had a three-cylinder variant in mind as well as a four-cylinder. And in 1986 it duly arrived, providing the power for the BMW K 75 (740cc, 55 kW/75 hp).

Innovations as standard: three-way catalytic converter, Telelever, new boxer engine and the renaissance of the single-cylinder bike.
Also worthy of special mention was the BMW K1 unveiled in 1988, which boasted an avant-garde approach to design and aerodynamics and a four-cylinder engine now developing 74 kW/100 hp thanks to the advent of four-valve technology. This, together with an increase in engine capacity to 1,171cc and a new nomenclature, fronted the next stage in the model series' development. The innovation which had the greatest impact, however, was the K1's three-way catalytic converter, which was making its debut appearance. The sporting headlines, meanwhile, were written by the BMW K 1200 RS launched in 1997, which produced 96 kW/130 hp and had a top speed of 245 km/h (152 mph).

Another groundbreaking innovation of the 1990s came in the area of suspension technology and was not reserved purely for the K series models.

The Paralever swing arm, which suppressed drive forces on the rear suspension, was joined in 1993 by Telelever front suspension. In this construction the telefork serves to locate the front wheel, while the actual suspension and damping is transferred to a central strut via an A-arm. This principle was applied for the first time in the new BMW R 1100 RS, whose chassis – in a new development – dispensed with a main frame. Instead, the engine-gearbox unit served as a load-bearing element for the steering head mounting and rear swing arm. The BMW R 1100 RS also showcased the debut of a totally newly developed boxer engine, whose 1,085cc capacity yielded output of 66 kW/90 hp. Air/oil cooling, four-valve technology, electronic fuel injection and a camshaft in the cylinder head were among the engine's other key features. Over the years that followed, this new motorcycle concept was carried over to all boxer models, including the new 850cc variants. Plus, in 1997, the BMW R 1200 C took to the road – and the silver screen, where the brand's first cruiser was ridden by Pierce Brosnan in the Bond film "Tomorrow Never Dies".

In 1993, after more than 25 years away, BMW staged a return to the single-cylinder class. The new series was granted a fresh model designation, not to mention a water-cooled single-cylinder engine producing 35 kW/48 hp co-developed with Rotax. The BMW F 650 was a lightweight and agile enduro-style motorcycle built at Aprilia in Italy. French rider Richard Sainct rode the rally version of the bike to victory in the Paris-Dakar Rally in 1999 and 2000.

Shortly before the turn of the millennium, BMW surprised the motorcycle world with a new and unique concept. The BMW C1 was offered in 125cc and 200cc versions and combined the manoeuvrability and compact design of a scooter with car-like standards of safety. The revolutionary roll-over protection and belt system of the BMW C1 meant that, in many markets, riders were not even required to wear a helmet.

S is for Sport, HP for High Performance.

With the second generation of the successful K series, the BMW engineers took four-cylinder engine technology literally in a new direction. For example, the powerplant for the BMW K 1200 S presented in 2004 was no longer mounted longitudinally to the direction of travel, but transversely. The high-performance unit also featured four-valve technology with cam followers and dry-sump lubrication. Boasting 123 kW/167 hp and a top speed of over 280 km/h (174 mph), the BMW K 1200 S was the most powerful and fastest motorcycle in the company's history. And the new Duolever front suspension with two longitudinal arms pivoting within their frame was introduced for the first time. Another global groundbreaker – the first electronically adjustable suspension system ever offered on a series-produced motorcycle – could be

specified as an option. The years that followed brought the launch of the BMW K 1200 R, a naked bike that also saw action in the BMW Power Cup race series, and a new edition of the K series (now with 1,300cc capacity).

At the same time, the sporting instincts of the boxer models were honed to even greater effect. A rigorous weight reduction programme, 81 kW/110 hp, an upside-down telefork and a central spring strut helped give the BMW HP2 enduro and BMW HP2 Megamoto their exclusive characteristics. In 2007 the BMW HP2 Sport was added to the new series, and its 98 kW/133 hp engine also saw action in the updated R series boxer models introduced two years later.

The launch of the BMW F 800 S, BMW F 800 ST, BMW F 800 R, BMW F 800 GS and BMW F 650 GS models in 2006 injected even greater variety into the engine range. These mid-range models now featured a two-cylinder powerplant with parallel cylinders. The broader scope of its model portfolio allowed BMW Motorrad to steadily increase its share of the various market segments. And in 2006, the brand's global annual sales broke through the 100,000-mark for the first time.

In 2009 the time had finally come to make some waves in the "super-sports" segment hitherto dominated by Japanese and Italian manufacturers. The BMW S 1000 RR made an immediate – and successful – impression in the Superbike World Championship, while the series-produced version of the bike topped a succession of comparison tests conducted by motorcycle magazines. The development engineers had approached the brand's entry into this prestigious class with an unwavering sense of purpose. Armed with a four-cylinder engine boasting 142 kW/193 hp, a dry weight of just 183 kilograms and the option of Race ABS and DTC (Dynamic Traction Control), the BMW S 1000 RR raised the bar in terms of both dynamics and active safety. The highlight of the new series took to the stage in 2012. The BMW HP4 was the first series-produced motorcycle with semi-active suspension; Dynamic Damping Control adjusts the compression and rebound rates of the upside-down fork and spring strut according to the situation at hand.

Compact and assured: a six-cylinder in-line engine on two wheels.
The taste for refinement, thirst for revs and assured power delivery that have become a hallmark of six-cylinder in-line engines from BMW appeared on the radar of motorcycle riders for the first time in 2010 with the debut of the world's most compact series-produced straight-six unit in the BMW K 1600 GT and BMW K 1600 GTL. Output of 118 kW/160 hp and maximum

torque of 175 Newton metres (129 lb-ft) imbued these luxury touring bikes with dynamic power development and an unmistakable soundtrack.

2012 also saw a passing of the baton to a new generation of the traditional boxer engine. The new BMW R 1200 GS not only traded air/liquid cooling for a glycol/water mixture for its 92 kW/125 hp engine, it integrated the previously bolted-on six-speed gearbox into the engine housing. The BMW R 1200 GS also gained a multi-plate wet clutch with anti-hopping function.

Pioneering concepts for tomorrow's urban mobility.
Alongside its continuous development of successful model series and forays into new segments of the classical motorcycle market, BMW Motorrad is also grasping the challenges of urban mobility, both now and in the future. For example, in 2011 the brand presented attractive single-track personal mobility solutions for city travel in the form of the BMW C 600 Sport and BMW C 650 GT Maxi-Scooters.

The BMW Group's sustainability strategy also encompasses the exploration of innovative drive system concepts, and in 2012 BMW Motorrad presented the close-to-production "BMW C evolution" e-scooter prototype. The company has since conducted extensive trials under real-life conditions to test the water for a market launch. The all-electric BMW e-scooter features technology based on BMW Group expertise and will come onto the market in the first half of 2014, following the launch of the BMW i cars. BMW Motorrad will therefore once again be leading the way in shaping the face of personal mobility – through cutting-edge concepts which bring new facets to the brand's premium character and ensure customers in the future will also be able to experience the pleasure of two-wheel motoring.

2. Milestones in technology.

For nine decades, the BMW Motorrad brand has been a byword for advanced solutions in personal two-wheeled mobility. Its products are developed by engineers who invest all their creative talent and energy into the quest for increased riding enjoyment, comfort and safety. From the very beginning, the company has advanced the frontiers of motorcycle development with pioneering new concepts, designs and technologies. Milestones range from aluminium alloy cylinder heads for the horizontally opposed "boxer" engine, the first telescopic front fork and aerodynamically optimised full fairings to the anti-lock braking system, the BMW C1 safety cage, the Telelever front wheel suspension and Dynamic Damping Control.

From early times to the present day, success in racing has always been the ultimate test of the performance and reliability of new models and technologies. And in turn, racing and sport – from the Mittenwalder Steig hill climb, and the BMW R 32's triumph there in February 1924, to countless six-day events, the Le Mans 24 Hours, the Tourist Trophy, the Paris-Dakar Rally or the recent Superbike World Championship races featuring the BMW S 1000 RR – have also always served as a springboard for further innovation. Over the past decades BMW Motorrad has always been a pioneer, not only in the development of engines, suspension systems and aerodynamics, but also in areas such as ergonomics, rider accessories and riding enjoyment per se.

Engines, transmissions, drive systems.

Twin-cylinder boxer engines have had a permanent place in the BMW motorcycle range from the earliest times. The brand's very first model, the BMW R 32 which debuted in 1923, already featured a boxer engine, along with a flange-mounted transmission and shaft drive. This first boxer engine's chief highlight was its transverse-mounted cylinders, an inspired solution from BMW chief engineer Max Friz which ensured that both cylinders received an equal amount of cooling air. Two years later, in the BMW R 37, the maximum power rating of this engine was doubled from 8 to 16 hp, using an aluminium cylinder head with overhead valves which was unique in motorcycle design at the time. Soon supercharging made its debut too, helping a BMW motorcycle take a world speed record in 1929, the first of many more to come.

The very first single-cylinder model from BMW, the BMW R 39, likewise featured an aluminium cylinder head. Pre-war BMW models boasted many

other pioneering features, too, including the first transverse kick starter crank on the BMW R 57 (1928), for easier starting, twin carburettors on the BMW R 16 (1932), and chain-driven overhead camshafts and a foot-shift four-speed transmission on the BMW R 5 (1936).

The engine of this BMW R 5 model offered a robust foundation for the resumption of development work in the post-war period. Incorporating various new features such as a single oil circuit for both cylinders, slanted carburettors and finned valve covers, this engine was used in the new BMW R 51/2. From 1955, the accompanying driveline featured not only a new three-shaft transmission but also a driveshaft with front universal joint. This new design catered for the greater angular displacements caused by increased rear suspension travel, which could no longer be handled by a conventional flexible elastomer disc. The BMW R 27 of 1960 brought further improvements in comfort due to the use of rubber bushes, which substantially reduced driveline vibration.

In the 1960s the boxer engines became more powerful, partly as a result of much higher compression ratios, modified valve timing and lift, and the use of larger slide carburettors. In 1969 BMW presented the R 75/5, its first model equipped with constant-vacuum carburettors for improved response and refinement. A further innovation on this model was a push-button electric starter. Subsequent engine versions in the years that followed had their displacement increased to as much as 980cc. In 1978 a new generation of boxer engines was then introduced, including versions with 473 and 649cc.

The new-generation boxer engine introduced in 1993 sported a raft of new features, the most important of which were four-valve cylinder heads, manifold injection and a three-way catalytic converter. Still based on this same format, in 2007 BMW developed what was at that time its most powerful production boxer engine ever. Featuring two overhead camshafts per cylinder, and maximum output of 98 kW/133 hp, it was this engine which powered the impressively dynamic BMW HP 2 Sport. The latest, current-generation boxer engine from BMW appeared in 2012. The new engine still features air/liquid cooling, but the liquid is now a glycol/water mixture. For the first time the air/fuel mixture and the exhaust gases flow vertically through the cylinder heads, rather than horizontally. An “e-gas” (electronically actuated throttle) system, a six-speed transmission integrated in the engine casing and a wet clutch with anti-hopping function are further features of this latest-generation boxer unit.

In 1983 BMW Motorrad launched a new type of engine – its first ever in-line (and first ever four-cylinder) unit. Also new was the fact that the engine of the

new BMW K 100 was mounted longitudinally to the frame and inclined 90 degrees to the left, to a horizontal position. This unusual layout was more compact and also offered more power. The engineers were able to apply the same principle in a second in-line engine version – a three-cylinder unit which made its debut in the BMW K 75, in 1986. Closely based on the four-cylinder unit, this engine also featured an innovative balancer shaft, which set new standards in comfort and refinement.

The first four-cylinder engine remained in production for 21 years. From 1988 it was further enhanced with four-valve DOHC cylinder heads, and the world's first digital engine management system for motorcycles. In 2004 a second-generation in-line four-cylinder engine was introduced, in the BMW K 1200 S. The new engine was instantly identifiable by its even more compact dimensions. Yet more strikingly, it was now transverse-mounted, with the cylinders inclined forwards by 55 degrees. Further highlights were the narrow valve angles, a 13.0:1 compression ratio and a dry sump lubrication system which is still unique in motorcycle design. The BMW K 1200 S also boasted the most advanced digital engine management system of the time, which included cylinder-specific, fully sequential injection, anti-knock control and a self-diagnostic system.

In terms of high-tech engine features, only the BMW S 1000 RR superbike offers more. Its extremely short-stroke engine is designed uncompromisingly for high performance, with maximum power of 142 kW/193 hp, maximum engine speed of 14200 rpm, titanium valves, variable intake manifolds and electronically controlled interference pipe valves in the exhaust system.

In 2006, the first "parallel twin" engines joined BMW's motorcycle in-line engine family. The twin-cylinder unit introduced on the BMW F 800 S featured manifold injection, electronic engine management and a three-way catalytic converter. The initial belt drive was later replaced by chain drive. In 2010, BMW went on to offer its first six-in-line engine, in the BMW K 1600 GT and BMW K 1600 GT, the narrowest and lightest straight-six ever used in a production motorcycle, and featuring electronic throttle valve control which registers the rider's wishes by means of a sensor in the accelerator twist grip.

Innovative development work on BMW motorcycle engines is continuing, and will ensure that future generations of BMW's boxer, single-cylinder and in-line engines take ride enjoyment, comfort and efficiency to even higher levels. Another, parallel focus of development work at the BMW Group is on sustainable drive technology, geared to new requirements in urban mobility. For example the BMW C evolution, presented in 2012, features an electric motor built into the swing arm and cutting-edge energy recuperation

technology. In addition, the lithium-ion battery of this near-production prototype electric scooter can be recharged via a passenger car-style charging socket. This feature is unique for an electric two-wheeler. On a full charge, the locally zero-emission BMW C evolution has a range of up to 100 kilometres (62 miles).

Wheel location, suspension, springing and damping systems.
Suspension-wise, the history of the BMW motorcycle got off to a rather bumpy start. The BMW R 32 of 1923 had an unsprung rear end, just a few centimetres of front suspension travel and no damping whatsoever. However, the general state of the public roads of the times, and the demands of racing, soon spurred the BMW engineers to come up with new solutions. The first major advance in terms of safety, comfort and ride enjoyment was offered by the hydraulically damped telescopic fork. BMW was the first manufacturer in the world to integrate such a system in a regular production motorcycle. First used in racing and then, from 1935, on the BMW R 12 and BMW R 17 production models, it replaced the previously customary cantilever spring. Three years later BMW also presented a new rear-wheel suspension system, which brought similarly sweeping improvements in traction and ride comfort. This system too was first pioneered in off-road motorsport.

Continuous improvement kept the combination of a front telescopic fork and straight-line suspension at the rear state-of-the-art for around 20 years. But then, in 1955, BMW came out with new benchmarks in its new full swing-arm models, the BMW R 50 and BMW R 69. An Earles-type front fork and dual rear swing am, combined with two hydraulic shock absorbers front and rear, took ride comfort to completely new levels. The driveshaft on these models was for the first time integrated in the swing arm.

It was not until 1969 that the telescopic fork, now extensively revised, made its comeback, with the launch of the /5 series. This new fork offered highest standards of comfort, reliability, precision and weight, and the innovations that followed now focused on the rear suspension. For example the BMW R 80 G/S of 1980, the first touring enduro, also featured the world's first single right-sided swing arm with single shock absorber. Just as stiff but significantly lighter than the previous design, the new system provided much more responsive rear suspension. A further advantage was that changing a wheel was now just as simple as on a car.

The integrated driveshaft, which had been retained, underwent further improvement with the Paralever rear swing arm of 1987. This newly developed double-jointed swing arm completely eliminated unwanted torque reactions in the rear suspension. It featured an additional universal joint at the

rear of the driveshaft, creating a parallelogram-type system which ensures that the rear wheel is unaffected by pitching movements due to weight transfer under acceleration and braking.

This was followed up, in 1993, by a revolutionary development for the front suspension as well. With the Telelever, a combination of a telescopic fork and a wishbone with central shock absorber, the tasks of wheel location and damping were for the first time separated. The new system soaked up the bumps with the greatest of ease, and generous amounts of suspension travel were always available even under fierce braking. A specially developed system for sports bikes, the Duolever, later made its debut on the BMW K 1200 S, which was presented in 2004. This front suspension system comprised two almost parallel wishbones, mounted in and turning within the frame. This allowed the transmission of steering forces to be separated from vertical wheel travel. Suspension and damping were provided by a central shock absorber attached to the lower wishbone.

The BMW K 1200 RS, likewise introduced in 2004, was also the world's first production motorcycle with optional Electronic Suspension Adjustment (ESA). ESA allows the rider to adjust the front and rear spring preload and damping by pressing a button on the handlebar. For spring preload, the rider could select between the settings "solo", "solo with luggage" or "rider with passenger and luggage". The damping could also be adjusted, with the options "Comfort", "Normal" and "Sports". From 2007 this technology was also offered for the BMW R 1200 GS enduro model. A second-generation ESA system presented in 2008 in the BMW K 1300 S, which also adds the ability to change the rear spring rate, was a further world first in motorcycle design, offering optimised manoeuvrability and comfort even when the bike was heavily laden. In 2012 this system evolved a stage further with the introduction of BMW Dynamic ESA. This semi-active suspension system, offered on the BMW R 1200 GS, for the first time provides automatic adjustment of damping to road conditions and the riding situation. Spring travel sensors monitor the vertical movement of the front and rear wheel suspension. The system is also able to communicate with the bike's other control systems. In the same year BMW also introduced a second semi-active suspension system, which was yet another world first. This Dynamic Damping Control (DDC) system, developed for the BMW HP4 superbike, offers a choice of four damping modes: "Rain", "Sport", "Race" and "Slick". Within each mode, the DDC control unit uses information about spring travel, road speed, throttle valve position and banking angle to select the optimal damping characteristics with split-second speed. Optionally, the compression and rebound stages can be controlled separately.

To improve braking safety, in 1988 BMW became the first motorcycle manufacturer in the world to offer an anti-lock braking system. Over the years, this system has been continuously improved in terms of sensitivity, control and user-friendliness, and it is now standard specification on all BMW motorcycle models. In 2009, a Race ABS version made its debut on the new BMW S 1000 RR super-sports bike. This system varies its control logic depending on the currently selected mode. Ultra-precise braking control is provided by the extremely accurate, BMW-patented Race ABS sensor system.

In connection with its work on ABS, in 2007 BMW also presented the ASC (Automatic Stability Control) traction control system. ASC can reduce the amount of engine power sent to the rear wheel, depending on road surface conditions. The system, which can be deactivated, prevents drive wheel spin, for more efficient power transmission and increased active safety. For the BMW S 1000 RR, additional safety for race-type acceleration is provided by the optional Dynamic Traction Control (DTC) system. This system also takes into account the banking angle of the motorcycle, maintaining rear wheel traction even in highly dynamic situations by reducing engine torque. The DTC system, too, varies its control logic depending on the selected mode.

The ultimate in exclusive control technology is provided by the Launch Control function of the BMW HP 4, which helps the rider convert engine power into forward propulsion to maximum effect when accelerating from a standing start. The system is effective in preventing both rear wheel spin and front wheel lift.

Frame design and aerodynamics.

By 1929, the soldered tubular frame of the first BMW motorcycles had given way to pressed-steel frames, which gave the BMW R 11 and BMW R 16 models a somewhat heavy appearance. These models were quickly seen as typifying the “German school” of motorcycle design. These robust looks were not only stylistically iconic but also had an important practical function, since increased performance now required sturdier construction. In the years that followed, frame design – just like suspension system design – was in a state of constant evolution, with the aim of providing a sportier ride, improved comfort and improved safety. For example, the first post-war models featured a bolted tubular frame, which on the BMW R 25 of 1950 was replaced by a welded tubular frame. A big advance in comfort came with the changeover from a sprung saddle-type seat to a bench seat, first featured on the BMW R 69 S of 1960. The double-loop tubular frame of the /5 series, launched in 1969, made way for a steel space frame in 1983 with the debut of the K Series. This in turn was succeeded in the 1990s by an aluminium bridge frame. An even more radical change in the basic layout of the motorcycle came with the BMW

R 1100 RS. With this model, introduced in 1993, BMW was the first major manufacturer to dispense with a conventional single-piece frame. Instead, the engine was used as a load-bearing member. At the front it was bolted to the steering head support while at the rear, in the area of the transmission housing, it supported the rear swing arm. Only the rear subframe, likewise bolted to the engine, was still made of steel.

The BMW engineers had been investigating drag and its effect on motorcycle performance ever since the 1930s, when Ernst Henne and other BMW works drivers set their world speed records. The record of 279.5 km/h set by Henne on 28 November 1937, riding a 500cc supercharged BMW motorcycle with streamlined fairings, was not broken until 14 years later. 30 years on, with intensive wind tunnel testing, BMW then launched a full-scale aerodynamics research programme. The results were used initially mainly in racing, and also in the development of the world's first mass-production motorcycle with handlebar-mounted fairing – the BMW R 90 launched in 1973. Wind tunnel research was then applied even more systematically in the development of the BMW R 100 RS. This model, which debuted in 1976, was the world's first production motorcycle with a wind tunnel-developed full fairing. As well as providing protection against the elements, this frame-mounted fairing allowed riders to travel long distances at high speed in an upright position. With the BMW R 100 RS, BMW also revived its world speed record traditions. Numerous speed records were now broken on the high-speed track in Nardo, Italy. The BMW K 1 of 1991, whose design included front and rear fairings and also a partial front wheel fairing, was a further milestone in aerodynamics.

Passive safety, ergonomics, lighting, driver assistance systems.
In 2000, BMW Motorrad presented a groundbreaking motorcycle concept which demonstrated the brand's creativity and innovative approach in the quest for new solutions in the field of motorcycle safety. The BMW C1 was presented as a pioneering city scooter which combined the low road-space requirements of a single-track vehicle with the safety of a modern small car. The unique concept of a safety cage and belt system for the rider even meant that in many countries BMW C1 riders were not legally required to wear a helmet.

BMW Motorrad's products offer enhanced safety and reduced fatigue with an ergonomically optimised seating position, ease of operation and positioning of all buttons, switches and hand- and foot-operated levers within easy reach. Intuitive operation of the dashboard display and easy-to-read instruments are particularly important. In this area, the multi-controller system first presented in 2009 on the BMW R 1200 RT sets new standards. In addition, adjustable

windshields, suspension-lowering kits and height-adjustable bench seats allow many models to be configured to suit the size of the individual rider.

Advanced lighting technology is a further area in which BMW Motorrad has repeatedly raised the bar on safety. One example, introduced on the BMW K 1600 GT and BMW K 1600 GTL, is the world's first motorcycle Adaptive Headlight system. This system adjusts the beam of the standard-fitted xenon headlights to take into account banking angle, pitch and cornering angle. Meanwhile, the BMW R 1200 GS, launched in 2012, is the world's first production motorcycle with optional full-LED headlights incorporating daytime lighting. Daytime lighting for improved visibility in traffic is also optionally available for the BMW K 1600 GT and BMW K 1600 GTL Touring models, and for the BMW C 600 Sport and BMW C 650 GT Maxi-Scooters.

Further safety improvements are being developed in the context of BMW Motorrad ConnectedRide, where work is under way on innovative rider assistance systems. BMW Motorrad and BMW Group Research and Technology are conducting a wide-ranging research project on V2V-based assistance systems. Such systems, whose purpose is to assist with the exchange of information and warnings and so prevent accidents, will in future also be fitted on standard-production BMW motorcycles. Since 2012, the BMW Group has been using both cars and motorcycles to carry out real-world field testing of such communication technology.

Rider accessories and training.

BMW Motorrad is the only manufacturer in the world with four decades of experience in the field of rider accessories. It has been offering helmets, protective suits, trousers, jackets, gloves and shoes since the 1970s. Numerous innovations in materials and technology, aimed at improving both comfort and safety, point to the high quality standards of BMW Motorrad accessories. These accessories have set new benchmarks, for example with BMW System helmets with flip-up front, NP protectors developed in cooperation with biomechanical engineers, or the neck brace system to prevent cervical spine injuries. The aerodynamic and acoustic qualities of BMW helmets are continuously optimised in wind tunnel research at the BMW Group's Aerodynamic Test Centre. BMW Motorrad is also playing a pioneering role in the development of communication systems. The BMW Motorrad communication system provides easier operation of the navigation system, mobile phone and audio system, as well as assisting communication between rider and passenger.

Almost as diverse as the rider accessories are the training options offered by BMW Motorrad. Rider training has been available ever since the 1970s, when

the first courses were held on the Nürburgring. In the 1980s, off-road rider training was added to the programme. The Hechlingen Enduro Park, opened in 1994, provides an off-road training venue which is unique worldwide. In every area, it offers training to meet the needs of motorcyclists from beginner to advanced level. The rider training programme ranges from safety training to intensive off-road courses and courses in performance riding on the race track. The modular course architecture means that participants can extend their motorcycling skills step by step. Professional training is provided by highly qualified instructors, who have been trained for example by the BMW Motorrad International Instructor Academy. In race track-based training, these instructors are frequently also assisted by well-known personalities from the racing scene.

3. Sporting success acts as a driving force and source of inspiration.

Sporting competition has been part of BMW's identity since the company's earliest days. And a rich history of records and championships garnered by aero engines, motorcycles and cars reflects BMW's impressive performance in head-to-head match-ups with sporting rivals. BMW motorcycles caught the eye as early as the 1920s, beating the brand's cars to the punch.

"Tested in motor sport, proven on the road."
It was a legendary German engineer who laid the foundations for BMW's success in motorcycle racing. In 1923 Max Friz, who had already gained international recognition with his BMW IIIa and BMW IV aero engines, laid down another milestone in the company's history with the development of the BMW R 32 motorcycle. Ahead of the official presentation of the BMW R 32 in May 1923, BMW's chief designer drove the car on the "Fahrt durch Bayerns Berge" time trial organised by Munich automobile club – without incurring a single penalty point. It hadn't taken long for BMW's motorcycle branch to back up its guiding principle "Tested in motor sport, proven on the road" with actions. The detailed design work for the BMW R 32 was carried out by Rudolf Schleicher, and on 2 February 1924 this young engineer and motorcycle racer also posted the day's best time in the Mittenwalder Steig hill climb, writing himself into the history of Bayerische Motoren Werke as the company's first ever winner of a motor sport event.

Schleicher designed a light-alloy cylinder head for the BMW R 37 – the first of its kind for a motorcycle – and in 1924 Franz Bieber won the Eifelbergrennen and Ruselbergrennen races, not to mention the German championship, with the new model. In the Solitude race outside Stuttgart, BMW works riders Bieber, Schleicher and Rudolf Reich all swept to class victories. These results saw the brand establish itself as the leading manufacturer in what was its first year on the racing scene – and open the floodgates to a wave of success: BMW racked up 91 wins in 1925, 105 in 1926 and 171 in 1927, collected every German championship title in the half-litre class in the years up to 1929 (as well as the 750cc crown in 1927) and held the title for machines with up to one-litre displacement from 1928 to 1932.

The company also made the breakthrough on the international stage. The 1926 edition of the six-day race in Buxton, England – at the time the world's most exacting off-road event – saw Rudolf Schleicher claim a gold medal in

the riders' competition. The British press was effusive in its praise of the BMW motorcycles, lauding them as "the most interesting machines in the competition" and confirming the burgeoning reputation the brand now also enjoyed outside Germany. On to 1927: the Targa Florio in Sicily – one of the world's toughest open-road circuit races – was dominated by BMW, factory riders Paul Köppen and Ernst Henne racing to a 1-2 finish on the Italian island. The BMW factory team had to wait six years for its next taste of glory, wrapping up victory in the nations' ranking at the Six Days Trial in Wales.

Ernst Henne and his extraordinary record collection.

In 1929 Ernst Henne rode a BMW motorcycle powered by a 750cc boxer engine to the first of the 76 world speed records he was to rack up over his career; on the road to Ingolstadt outside Munich he stormed to a speed of 216.75 km/h (134.67 mph). Over the ensuing years, Henne – one of the most successful motorcycle racers of all time – gradually raised the bar to ever more impressive heights until, on 28 November 1937, he guided a supercharged, full-fairing 500cc BMW to a speed of 279.5 km/h (173.7 mph) on the autobahn near Frankfurt am Main. It was 14 years before the world record would be broken again.

Ernst Henne proved to be an ideal ambassador for the BMW motorcycle brand, but he wasn't alone. By 1938, "Schorsch" Meier was making quite a name for himself, thanks to victory in the 500cc German and European championships. This success set the scene for his big international break, as Meier – on board a supercharged BMW racing machine – became the first rider from outside the British Isles to win the Isle of Man Senior TT for 500cc machines. Another BMW rider, Britain's Jock West, finished in second place. The result meant BMW had now etched its name onto every major national and international trophy, creating a sporting halo that also shone over the brand's series-produced models.

New beginning headlined by familiar faces and new ideas.

The name "Schorsch" Meier is also closely entwined with the renaissance of motorcycle racing after the Second World War. Races were taking place again as early as 1946, and the following year Meier claimed the first German championship of the post-war era with the proven supercharged racing machine. It was a trick Germany's "Sportsman of the year" for 1949 was to repeat in each of the following three seasons. Other riders were also contributing to BMW's success; the company amassed 119 race victories and seven national championship crowns between 1947 and 1949. It was fitting that Meier would bring the curtain down on his career with one final German championship title in 1953.

Going into the 1951 season, international motorcycle racing's governing body – the FIM – had lifted its ban on German riders competing in its events. Firmly on the black list, however, were forced-induction engines, which meant BMW was obliged to replace its successful supercharged engines for international competitions with new, naturally aspirated units. The impressively lightweight BMW RS 54 (weighing just 130 kilograms) set a successful seal on the switchover in 1954. Its 33 kW/45 hp boxer engine featured vertical shaft drives and twin overhead camshafts per cylinder and propelled the bike to almost 200 km/h (124 mph). The BMW RS became an instant hit, primarily with privateer riders, and its engine later also took a star turn in sidecar racing.

BMW soon set about reviving former glories on the international stage as well. Walter Zeller was runner-up in the 1956 world championship with a BMW factory machine and Dickie Dale finished the 1958 season in third position. Rather more spectacular, however, was the run of victories in sidecar racing started by Wilhelm Noll and Fritz Cron. Between 1954 and 1974 BMW collected no fewer than 19 riders' world championship titles and 20 manufacturers' crowns, the BMW pairing of Klaus Enders and Ralf Engelhardt alone accounting for six of those triumphs in the late 1960s and early 1970s. Never before had one manufacturer dominated a category of motor sport in such fashion. This extraordinary period of success also saw BMW set 21 endurance world records. In 1955, for example, Wilhelm Noll posted an absolute world speed record of 280.2 km/h (174.1 mph) with a BMW sidecar machine.

Prize-winning move from the road to the rough.

The BMW R 69 S presented in 1960 placed its sporting potential under the spotlight on a variety of stages, including endurance races like the Bol d'Or and 24 Hours of Montlhéry in France, and a number of endurance world record attempts. Added to which, privateer riders used a specially adapted variant of the BMW R 69 S to achieve great success in off-road competitions. Sebastian Nachtmann and Kurt Tweesmann won the German off-road championship on several occasions, and Herbert Schek followed in their tyre tracks with the successor model, the BMW R 75/5, from 1970 to 1972. Richard Schalber and Werner Schütz added their names to the national title-holders riding boxer-engined BMW motorcycles.

Road racing also provided fertile ground for international glory in the 1970s. Hans-Otto Butenuth and Helmut Dähne celebrated a class win in the 1976 Production TT with the BMW R 90 S, Steve McLaughlin rode the same bike to victory in the Daytona 200 race, and his team-mate Reg Pridmore was crowned US Superbike champion the same year. Dähne was also part of the

teams that set world records with the BMW R 100 RS at the Nardo track in Italy in 1977 and 1980.

BMW also had its sights set on adding to its international off-road trophy haul. In 1980 Rolf Witthöft was crowned European champion and topped the team standings with his German colleagues in the Six Days Trial in France. A series-produced offshoot of the successful motorcycle soon went on sale to customers, and the reign of the BMW R 80 G/S had begun. In 1981 French rider Hubert Auriol lined up on board the boxer enduro for the legendary Paris-Dakar Rally – and duly finished top of the motorcycle standings. His thirst unquenched, Auriol repeated his taming of the world's most challenging off-road stage race two years later. In 1984 and 1985 Gaston Rahier was the victorious rider, each time on close-to-series 1,000cc models, and in 1999 and 2000 Richard Sainct took the honours with a rally version of the BMW F 650. Indeed, BMW riders made 2000 a year to remember, locking out the top four places in the overall classification. The company has also teamed up with German riders to outstanding effect, Jutta Kleinschmidt and Andrea Mayer (on three occasions) winning the women's trophy in the Dakar on BMW bikes.

In the more recent past, Finnish rider Juha Salminen has enjoyed success in classical off-road racing. In 2009 he finished runner-up in the E2 class of the enduro world championship (for two-stroke bikes up to 250cc and four-stroke machines up to 450cc) on a BMW G 450 X.

Fresh success on the Isle of Man and at Le Mans.

The single-cylinder engine in the BMW F 650 powered the winning motorcycle not only over the desert sand of the Paris-Dakar Rally but also on the roads of the similarly legendary Tourist Trophy on the Isle of Man. The Chrysalis team from Southampton, England integrated the engine into an aluminium bridge frame built by British chassis manufacturer Harris. The result was a lightweight motorcycle (weighing just 134 kilograms and developing 59 kW/80 hp), which Dave Morris rode to three successive victories – in 1997, 1998 and 1999 – in the single-cylinder class at the TT.

The BMW boxer engine also made a triumphant return to endurance racing. Exactly 50 years after Walter Zeller's final outing as a factory rider in 1957, the BMW Motorrad Motorsport Endurance Team made its debut in the Le Mans 24-hour race. Riders Markus Barth, Thomas Hinterreiter and Rico Penzkofer finished 16th in the overall standings and top of the Open Class with their BMW HP2 Sport. In all, the BMW Motorrad team notched up four class wins in the 2007 endurance world championship on their way to a resounding victory in the Open Class.

In between times BMW Motorrad has also captured the imagination with an attractive single-make series of its own. The BMW Motorrad boxer Cup, an international competition held for the first time in 2001, saw 30 riders from across Europe lock horns with identical BMW R 1100 S bikes. For the 2005 season the BMW Motorrad Boxer Cup became the BMW Motorrad Power Cup, with the BMW K 1200 R providing the hardware for some spectacular racing.

BMW S 1000 RR charts a path to Superbike glory.

The presentation of the BMW S 1000 RR revealed the company's next move on the racing scene, the newly formed BMW Motorrad Motorsport team launching its first Superbike World Championship campaign in 2009 with the new super-sports machine. In the first race of the season at Phillip Island, Australia, local hero Troy Corser sent ripples through the Superbike community by securing an eighth-place finish and the fastest race lap. This promising result first time out provided the springboard for a continuous upward curve on both the national and the international scene. In 2010 Corser secured BMW's first podium finishes in the Superbike World Championship. In the Superstock 1000 FIM Cup, meanwhile, Italian rider Ayrton Badovini rode a largely production-spec BMW S 1000 RR to nine wins in 10 races – and a comfortable title victory. And BMW also finished second in the manufacturers' standings of the Superbike IDM (International German Championship) that season, its first in the competition. 2011 was a year of outstanding results, culminating in fifth place overall in the Superbike World Championship and the manufacturers' title in the IDM.

The brand's first World Championship victories duly followed in 2012. The Italian Marco Melandri piloted his BMW S 1000 RR to six race wins and only narrowly missed out on the world title. BMW Motorrad won the riders' and manufacturers' titles in the IDM with something to spare.

After more than 30 years away, BMW Motorrad returned to the Sidecar World Championship in 2012, Jörg Steinhausen – son of the 1975 and 1976 sidecar world champion Rolf Steinhausen – teaming up with Grégory Cluze. Their racing sidecar wore the traditional BMW racing livery and was powered by the engine from the BMW S 1000 RR. The double act finished their comeback season as World Championship runners-up.

4. The pleasure of motorcycling, made in Berlin.

Before BMW motorcycles can start delivering riding pleasure on the road and success in race competition, they must graduate from a sophisticated production process in which technology, tradition and timing are all of key importance. The history of BMW motorcycle production is inextricably linked with the city of Berlin. After all, the BMW plant in Berlin-Spandau is not only an important supplier to the company's car production facilities but, beyond that, also the sole German branch of a state-of-the-art production network in which man and machine join forces to build two-wheeled dreams.

Built in Spandau in 1928, the plant has been owned by BMW since 1939, which makes it one of the most history-laden locations in the BMW Group's global production network. BMW's operations in Berlin began with the construction of aero engines, as was also the case at the company's original plant in Munich. Among the assemblies produced at the plant were engines for the legendary JU 52 aircraft. Manufacture of motorcycle parts in Berlin began in 1949. Initially, these parts were sent to the Munich plant where motorcycle assembly had been concentrated since 1923. From 1967, however, the entire motorcycle production operation was relocated in stages from Munich to Berlin.

Launch of the /5 series – the first successful model to be built from scratch in Berlin.

In 1969, following the start of engine assembly operations, full vehicle production also got under way at the Berlin plant with the construction of the newly developed /5 series. In those early days the workforce of around 400 employees would turn out 30 motorcycles per day – all made by hand. This meant capacity at the original plant in Munich could be used in full for car production, which was increasingly gaining in importance. Despite a downturn in the market, BMW had decided to press ahead with its commitment to the Berlin factory. Public investment subsidies supported the company's strategy, which was soon shown to be impressively visionary. Demand for the new models steadily pushed up production figures and created a stream of new jobs. By 1973 the Berlin plant was celebrating production of the 500,000th BMW brand motorcycle.

Today, the Berlin-Spandau site spans roughly 178,000 square metres (almost two million sq. ft.) and employs a workforce of 1,900. Up to 700 motorcycles

per day roll out through the doors of the consistently expanded and modernised plant, which also produces more than six million brake discs every year for BMW cars. In 2001 the Berlin plant built the one-millionth BMW motorcycle, and just 10 years later that figure had already passed the two-million mark. December 2011 witnessed the dawn of a new era in motorcycle building in Berlin when production began of the dynamic BMW Maxi-Scooters. And in 2012 BMW Motorrad posted record worldwide sales of 106,358 units; it seems that riding pleasure "made in Berlin" is more desirable than ever.

South America is home to the company's second motorcycle production facility; since 2009 BMW motorcycles have been assembled from Completely Knocked Down (CKD) sets in Manaus, Brazil. The CKD process involves packing certain parts and components into parts sets within precisely arranged assembly stages before being dispatched to the relevant countries. These sets are then completed with parts produced in the partner countries, and assembly takes place locally in keeping with the BMW Group's internationally applicable quality standards. The cooperation in Brazil sees BMW working together with local motorcycle producer DAFRA Motos.

Perfection in five stages: the production process at BMW's Berlin-Spandau plant.

Before BMW motorcycles can begin serving up their riding pleasure, they have to pass through five production stages at Berlin-Spandau. The mechanical production teams create the engine's core components, such as the engine housing, cylinder heads, crankshafts and connecting rods, plus the frame, fuel tanks and suspension components. The extremely precise processing centres are located in halls boasting listed building status. Tradition is also an important factor in maintaining the high proportion of parts and bikes still made by hand, an approach that gives the highly skilled employees the chance to display their experience and sense for quality.

Each day, two shifts totalling around 150 BMW engine assembly experts use three highly flexible assembly systems to piece together up to 450 high-performance engines – with two (boxer), four or six cylinders – out of more than 600 different parts and components. The employees team up with 21 automated units to assemble the engines. Extensive function tests and sophisticated testing technology ensure that the drive units meet customers' high expectations of BMW engines in terms of performance and reliability.

Every day in the paintshop, meanwhile, several thousand motorcycle parts are given their particular colouring. This facility is designed to enable the five computer-controlled robots to paint components of varying size and geometry in no set order. For example, 70 different moulds can be coated in more than

30 shades of water-based paint without interruption. To oversee this valuable work, BMW Motorrad's Berlin-Spandau plant calls on the skill of experienced paint experts. Understandably so, since a dextrous is hand is particularly important when it comes to applying the traditional decorative lines and tape applications on the fuel tanks and fairings.

The BMW motorcycles are guided along the plant's approximately 500-metre-long (1,640 ft.) assembly line – on a flexible conveyor system with pivoting hooks – to the 150 working stations. There they are raised or lowered automatically to the ergonomically optimal working height. All order-specific details as well as tightening torque and model settings are also passed on automatically to the relevant working station. Depending on the model, as many as 2,000 parts and components are brought together here into a ready-to-ride BMW motorcycle – a job that takes between 220 and 360 minutes. The greatest investment of time is accounted for by the municipal bikes which need to be equipped with features including radio systems, sirens and signalling systems. Complex and precise assembly logistics allow each and every BMW motorcycle to be kitted out with an array of special accessories and optional equipment items, as requested by the customer.

The BMW motorcycles are prepared for dispatch in the finishing area. Here they are packed into reusable, folding steel casings to be transported from Germany to the company's main European export markets. Motorcycles destined for overseas are loaded into high-strength wood/cardboard transportation containers. Wherever a BMW motorcycle's journey takes it, you can be sure the shipment process has been planned with sustainability and efficient logistics at the top of the priority list.

5. Overview of facts and stats.
5.1 BMW Motorrad in motor sport.

1923	Max Friz completes the “Fahrt durch Bayerns Berge” trial on a BMW R 32 prototype without incurring a single penalty point.
1924	On 2 February Rudolf Schleicher posts the day’s best time in the Mittenwalder Steig hill climb, writing himself into the history of Bayerische Motoren Werke as the company’s first ever winner of a motor sport event. Three BMW works riders – Schleicher, Franz Bieber and Rudolf Reich – line up for the Solitude race outside Stuttgart, and all three sweep to victory in their respective classes. Franz Bieber gives BMW its first German championship win – in the 500cc class – in the competition’s inaugural year. Bieber also wins the Eifelbergrennen and Ruselbergrennen races.
1925	Josef Stelzer is crowned German champion in the quarter-litre class.
1926	Ernst Jakob Henne wins the national title in the half-litre class. Rudolf Schleicher wins a gold medal in the riders’ competition at the six-day cross series in Buxton, England, handing BMW its breakthrough success on the international stage. Schleicher, his BMW team-mate Fritz Roth and Gustav Gubela – riding a Macebo – earn Germany third place in the nations’ ranking.
1927	Hans Soenius wins the 500cc class of the German championship, while Ernst Jakob Henne claims the 750cc crown.
1928	Hans Soenius defends his title in the half-litre class. Ernst Jakob Henne celebrates victory in the Targa Florio in Sicily.
1929	Paul Köppen wraps up another win in the Targa Florio. Hans Soenius races to his third national triumph in a row in the 500cc class. Ernst Jakob Henne hits a top speed of 216.75 km/h (134.67 mph) on a 750cc BMW to post the first of his 76 world speed records on BMW motorcycles.
1930	Fritz Wiese wins the German title in the over-500cc class.
1931-1932	Ralph Roese wins back-to-back German championship titles in

the over-500cc class.

1933-1935 In 1933 the BMW team hands Germany its first victory in the nations' ranking at the International Six Days Trial in Llandrindod, Wales – a title it successfully defends in the following two years.

1936-1939 First Grand Prix wins in 1936 and 1937.

On 28 November 1937 Ernst Jakob Henne sets a new world speed record. His 279.5 km/h (173.7 mph), posted on the autobahn near Frankfurt am Main, remains intact for 14 years.

Karl Gall, Georg Meier and Ludwig Kraus record a string of 500cc German championship victories stretching from 1937 to 1939.

Georg Meier wins the 500cc European championship in 1938. The following year he becomes the first rider from outside the British Isles to win the Senior TT on the Isle of Man.

1947-1951 Georg Meier (1947–1950) and Walter Zeller (1951) win five German titles in succession in the half-litre class.

1953-1959 BMW strings together an unbroken run of seven German titles in the 500cc class courtesy of Georg Meier (1953), Walter Zeller (1954, 1955), Ernst Riedelbauch (1956) and Ernst Hiller (1957–1959).

Walter Zeller narrowly misses out on the 1956 world title in the 500cc class. His second-place finish remains the best performance by a German rider in the blue-riband category of motorcycle racing. American rider Dickie Dale finishes the 1958 season in third place.

1954–1974 BMW establishes a stranglehold over its rivals in sidecar racing. Boxer injection engines propel BMW to 19 riders' and 20 manufacturers' world titles out of a possible 21. The BMW pairing of Klaus Enders and Ralf Engelhardt alone account for six of those triumphs between 1967 and 1974.

1960-1972 Sebastian Nachtmann and Kurt Tweesmann win the German off-road championship several times with a variant of the BMW R 69 S. Herbert Schek follows in their tyre tracks with the successor model, the BMW R 75/5, from 1970 to 1972.

1961-1962 Hans-Günther Jäger and Ernst Hiller record back-to-back German titles in the 500cc class.

1971 Hans-Otto Butenuth becomes German champion in the half-litre class.

1976 Butenuth and Helmut Dähne ride the BMW R 90 S to class victory in the Production TT on the Isle of Man.

	BMW makes its debut in the US Superbike championship with the Butler & Smith Team. Steve McLaughlin (USA) rides a BMW R 90 S to victory in the season-opening Daytona 200 race. Reg Pridmore (USA) finishes the season top of the pile to become the inaugural US Superbike champion with the same machine.
1979-1980	Richard Schalber is crowned 1979 German off-road champion and finishes third in the European championship. The following year Werner Schütz clinches the German title and Rolf Witthöft rides a BMW R 80 G/S to the European off-road championship crown in the “up to 1,000cc” class.
1981	Hubert Auriol (FRA) wins the motorcycle category of the Paris-Dakar Rally astride a BMW R 80 G/S.
1983-1985	Further overall victories in the Paris-Dakar Rally follow courtesy of Auriol (1983) and Gaston Rahier (BEL, 1984-1985).
1994-2002	BMW racks up five wins in the women’s trophy at the Paris-Dakar Rally: Jutta Kleinschmidt in 1994, Andrea Mayer in 1999, 2001 and 2002.
1995	Herbert Enzinger wins the German Supermono championship for the PAMI team on a bike powered by a BMW engine.
1997-1999	Dave Morris (GB) wins the single-cylinder class of the Tourist Trophy on the Isle of Man for the Chrysalis team. The engine powering Morris’ bike – taken from the BMW F 650 – is integrated into an aluminium bridge frame built by British chassis manufacturer Harris.
1999	Richard Sainct (FRA) tops the motorcycle standings in the Paris-Dakar Rally on a BMW F 650.
2000	BMW riders Sainct, Oscar Gallardo (ESP), Jimmy Lewis (USA) and Jean Brucy (FRA) complete a clean sweep of the top four places in the motorcycle classification at the Paris-Dakar Rally. Jimmy Lewis wins the Dubai Rally on a BMW R 900 RR.
2001	The first running of the BMW Motorrad Boxer Cup sees 30 riders from across Europe lock horns with identical BMW R 1100 S bikes. For the 2005 season the single-make series is renamed the BMW Motorrad Power Cup and the BMW K 1200 R replaces the BMW R 1100 S.
2007	Markus Barth, Thomas Hinterreiter and Rico Penzkofer ride the BMW HP2 Sport to Open Class victory at the Le Mans 24-hour race. The BMW team notches up another three class wins in the remaining four races of the 2007 endurance world championship on their way to a resounding overall title victory in the Open Class.
2009	Juha Salminen (FIN) finishes runner-up in the E2 class of the

enduro world championship on a BMW G 450 X.

2010 Ayrton Badovini (ITA) wins nine out of 10 Superstock FIM Cup races on a BMW S 1000 RR.

2011 Juha Salminen takes the enduro world championship title in the E1 class on a bike from the Husqvarna brand owned by BMW Motorrad.

BMW Motorrad wins the manufacturers' title in the Superbike IDM (International German Championship).

2012 BMW returns to the Sidecar World Championship after 30 years away. In the company's first year back, the German-French pairing of Jörg Steinhausen and Grégory Cluze finish in second place in a racing sidecar powered by the engine from the BMW S 1000 RR.

Sylvain Barrier (FRA) rides the BMW S 1000 RR to victory in the Superstock 1000 FIM Cup. His compatriot Erwan Nigon wins the Superbike IDM with the same machine.

The BMW S 1000 RR also records six race wins (with Italian rider Marco Melandri on board), as well as 16 podium finishes and five fastest race laps in the Superbike World Championship.

5.2 Production figures.

Model	Production period	No. of units
R 32	1923–1926	3090
R 39	1925–1927	855
R 42	1926–1928	6502
R 2	1931–1936	15207
R 12	1935–1942	36008
R 5	1936–1937	2652
R 35	1937–1940	15386
R 24	1948–1950	12020
R 25, R25/2, R 25/3	1950–1956	109751
R 51/3	1951–1954	18420
R 50, R 50/2, R 60, R 60/2	1955–1969	53382
R 69, R 50 S, R 69 S	1955–1969	15907
R 26, R 27	1956–1966	45600
R 50/5, R 60/5, R 75/5	1969–1973	68946
R 90 S, R 100 S, R 100 CS	1973–1984	33265
R 60/6, R 60/7, R 75/6, R 75/7, R 80/7, R 90/6, R 100/7, R 100 T, R100	1973–1984	97252
R 100 RS	1976–1984	33648
R 100 RT	1978–1984	18015
R 45, R 65	1978–1985	57612
R 80 G/S, R 65 GS	1980–1990	23591
K 100, K 100 RS, K 100 RT, K 100 LT	1983–1992	97575
K 75, K 75 C, K 75 S, K 75 RT	1985–1996	67964
R 80 GS, R 100 GS, R 100 GS Paris-Dakar	1987–1996	45364
K 1	1989–1993	6921
K 1100 LT, K 1100 RS	1991–1998	34936
F 650, F 650 ST	1993–2000	63339
R 1100 GS, R 850 GS	1993–2000	45870
R 1100 RS	1993–2001	26037
R 1100 RT	1995–2001	53092
R 1100 R	1996–2000	53685
K 1200 RS	1997–2005	37687
R 1100 S	1998–2005	33742
R 1150 RT	2001–2005	57048
F 650 CS	2002–2005	20846

5.3 Technical specifications.

Model	Year	Engine	Cooling	cc	Output in kW(hp)/rpm	Kerb wt. in kg	V_{max} in km/h
R 32	1923	boxer/2/ sv	air	494	6 (8.5)/3,200	122	100
R 12	1935	boxer/2/ sv	air	745	15(20)/4,000	185	110
R 5	1936	boxer/2/ ohv	air	494	18(24)/5,800	165	140
R 24	1948	sing.-cyl./ ohv	air	247	9(12)/5,600	130	95
R 51/3	1951	boxer/2/ ohv	air	494	18(24)/5,800	190	135
R 69 S	1960	boxer/2/ ohv	air	594	31(42)/7,000	202	175
R 75/5	1969	boxer/2/ ohv	air	745	37(50)/6,200	210	175
R 90 S	1973	boxer/2/ ohv	air	898	49(67)/7,000	215	200
R 100 RS	1976	boxer/2/ ohv	air	980	51(70)/7,250	230	200
R 80 G/S	1980	boxer/2/ ohv	air	797	37(50)/6,500	186	168
K 100 LT	1986	in-line/4/ dohc	liquid	987	66(90)/8,000	283	215
K 1	1988	in-line/4/ dohc	liquid	987	74(100)/8,000	234	240
R 1100 RS	1993	boxer/2/ cih	air/ liquid	1,085	66(90)/7,250	239	215
F 650	1993	sgl-cyl./ dohc	liquid	652	35(48)/6,500	191	163
K 1200 S	2004	in-line/4/ dohc	liquid	1,157	123/(167)/10,250	248	280
F 800 S	2006	in-line/2/ dohc	liquid	798	62.5 (85)/8,000	204	>200
S 1000 RR	2009	in-line/4/ dohc	liquid	999	142 (193)/13,000	204	299
K 1600 GT	2010	in-line/6/ dohc	liquid	1,649	118(160)/7,750	306	250
R 1200 GS	2012	boxer/2/ dohc	air/ liquid	1,170	92(125)/7,700	238	>200

5.4 History of innovations.

1923 BMW's chief engineer Max Friz develops a boxer engine with two transverse-mounted cylinders. This principle of design proved to be an inspired response to the challenge of feeding both cylinders with an equal amount of cooling air. A feature of the brand's first model (the BMW R 32), it became an identity-defining thread running through the history of BMW Motorrad engine technology.

1925 The aluminium cylinder head / overhead valve design – without parallel in the motorcycle world – doubles the power output of the BMW R 37. The first single-cylinder model, the BMW R 39, also features this technology.

1928 The first kick-starter crank is presented on the BMW R 57 to enable easier starting.

1929 Supercharger technology paves the way for BMW motorcycles to set their first world speed records.

1932 Twin carburettor technology is presented on the BMW R 16.

1934 The soldered tubular frame is replaced by a pressed-steel construction, which gives the BMW R 12 and BMW R 17 a heavy appearance. References to the "German school" of motorcycle design abound.

1935 In the BMW R 12 and BMW R 17 the hydraulically damped telescopic fork first tested in race competition replaces the previously standard cantilever spring.

1936 Chain-driven overhead camshafts and a foot-shift four-speed gearbox are introduced for the BMW R 5.

1938 The rear-wheel suspension system already employed successfully in off-road racing enters series production – and promptly takes traction and ride comfort to a new level.

1950 The engine from the BMW R 5 incorporates various new features in the BMW R 51/2, such as a single oil circuit for both cylinders, slanted carburettors and finned valve covers.

The BMW R 25 is given a welded tubular frame, consigning the bolted tubular frame of the first post-war models to history.

1955 A new three-shaft transmission and a driveshaft with front universal joint take care of power transfer.

The launch of the BMW R 50 and BMW R 69 brings with it the premiere of the full swing-arm suspension. The telescopic fork and straight-line suspension are replaced by an Earles-type front fork and dual rear swing arm, which take ride comfort to unprecedented levels. The driveshaft is now integrated into the swing arm.

1960 The BMW R 69 S marks the changeover from a sprung saddle-type seat to a bench seat, which increases comfort levels significantly.

The single-cylinder BMW R 27 provides far greater comfort thanks to “silent block” rubber bushes, which substantially reduce driveline vibration.

1969 The BMW R 75/5 is equipped with constant-vacuum carburettors for improved response and refinement as well as an electric engine starter.

The debut of the /5 series sees BMW introduce a completely new design for the boxer engine, which holds sway until 1993. Identifying features include camshafts and push rods located below the crankshaft and cylinders. The telescopic fork also makes a comeback in updated form. Another new feature is the double-loop tubular frame.

1973 The BMW R 90 – the world’s first volume-produced motorcycle with a handlebar-mounted fairing – is launched. This represents a milestone in the history of aerodynamic development.

Wind tunnel research is applied even more systematically in the development of the BMW R 100 RS. This model is the world’s first production motorcycle with a full fairing.

1980 The BMW R 80 G/S lays the foundations for the touring enduro segment and reveals the world’s first single swing-arm construction.

This brings the advantages of lower weight and more responsive rear suspension, and makes it easier to change the wheel.

1983 In addition to its boxer and single-cylinder engine variants, the BMW K 100 gives a debut to a third power unit: the first in-line and first four-cylinder unit ever offered by BMW Motorrad. In another new development, the engine is longitudinally mounted.

The launch of the K series models brings the introduction of the steel spaceframe, which in turn makes way for the aluminium bridge frame – but not until the 1990s.

1986 The BMW K 75 is fitted with a second in-line engine variant. Closely based on the four-cylinder unit, this three-cylinder engine features an innovative balancer shaft to enhance refinement.

1987 BMW Motorrad presents the Paralever construction – a newly developed double-joint swing arm that eliminates unwanted drive forces on the rear suspension.

1988 Four-valve technology, DOHC cylinder heads and the world's first digital engine electronics for motorcycles are introduced in the four-cylinder engine.

BMW is the world's first motorcycle manufacturer to offer anti-lock brakes (ABS) for its models. This braking safety technology is constantly optimised and is today fitted as standard on all BMW motorcycles.

1991 Further aerodynamic progress is made with the BMW K 1. As well as the front and rear, a section of the front wheel now also has a fairing.

1993 The latest stage of boxer engine development introduces innovative details such as four-valve technology, manifold injection and a three-way catalytic converter.

In a revolutionary new development for the front suspension, the Telelever construction – a combination of a telescopic fork and a wishbone – now separates the tasks of wheel location and damping.

1994 The BMW R 1100 RS embodies a fundamental shift in the basic construction of a motorbike. BMW is the first volume manufacturer to

do away completely with the previously standard main frame. The engine now serves as a load-bearing element.

2000 Optimised safety on two wheels is revealed in the form of the BMW C1, an urban vehicle that combines the low road-space requirements of a single-track vehicle with the safety of a small car.

2004 The successor to the four-cylinder engine introduced in 1988 makes its debut in the BMW K 1200 S. The new in-line unit is transversely mounted and the cylinders are inclined forwards by 55 degrees. Other highlights include new digital engine management and a dry sump lubrication system which is still unique in motorcycle design today.

First the Telelever, now the Duolever. This front suspension system comprises two almost parallel wishbones, mounted in and turning within the frame. The BMW K 1200 RS is the world's first series-produced motorcycle to feature ESA (Electronic Suspension Adjustment).

2006 A two-cylinder unit is added to the family of in-line engines. The parallel-twin fitted in the BMW F 800 S initially uses a belt drive, but this is later replaced by chain drive.

2007 The BMW HP 2 Sport is the most powerful series-produced boxer model to date. With two overhead camshafts per cylinder, the engine generates maximum output of 98 kW/133 hp.

ESA technology with extended adjustment options is now available for the BMW R 1200 GS enduro model.

ASC (Automatic Stability Control) is unveiled. This system prevents the driven wheel from spinning, enabling efficient power transmission and increased active safety.

2008 The BMW K 1600 GT and BMW K 1600 GTL tourer models offer two world firsts: the multi-controller for intuitive operation of the onboard monitor and the Adaptive Headlight system.

The second-generation ESA system, which adds the ability to change the rear spring rate, is presented as another world first in motorcycle design for the BMW K 1300 S.

2009 The brand's first super-sports motorcycle, the BMW S 1000 RR, is fitted with a short-stroke four-cylinder engine which develops 142 kW/193 hp, can spin to 14,200 rpm, and has titanium valves, variable intake manifolds and adjustable interference pipe valves in the exhaust system. Also new are the button-controlled Race ABS and DTC (Dynamic Traction Control) systems.

2010 The slimmest and lightest in-line six-cylinder engine ever fitted in a series-produced model now powers the BMW K 1600 GT and BMW K 1600 GTL.

2012 The latest generation of BMW's boxer engine is presented – still with air/liquid cooling, but the liquid is now a glycol/water mixture which, for the first time, flows vertically through the cylinder heads.

The electric motor powering the close-to-series BMW C evolution e-scooter prototype generates zero local emissions and has a range of up to 100 kilometres (62 miles).

The first ever semi-active suspension system, known as BMW Dynamic ESA, is presented. The electronically controlled suspension of the BMW R 1200 GS adapts the bike's damping automatically to the road condition and situation at hand. The BMW R 1200 GS can also be fitted with full-LED headlights – a world first for a series-produced motorcycle.

A second semi-active suspension system is developed for the BMW HP4 super-sports model based on the BMW S 1000 RR. Dynamic Damping Control (DDC) – a world first – offers the rider specific damping settings to suit various riding modes.

The BMW Group uses both cars and motorcycles in real-world field trials of innovative rider assistance systems. BMW Motorrad ConnectedRide includes systems which enable vehicle-to-vehicle and vehicle-to-infrastructure communication to help avoid accidents.

2013 The BMW HP 4 is now equipped with super-exclusive Launch Control. This function helps to convert the engine's power into forward propulsion to maximum effect when accelerating from a standing start.