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BMW Classic live

5 WINS. FOR THE SIXTH TIME.

BMW AG

FURTHER TOPICS

MILLE MIGLIA SPECIAL
BMW AND AERODYNAMICS
THE FIRST BOXER ENGINE

Dear friends of the brand,

BMW Classic and the BMW Museum are expecting an eventful year.

70 years ago, BMW achieved the overall victory at the legendary Mille Miglia. At the Milla Miglia Storica in May, we want to celebrate this success with you and with the stars of that performance. These stars have four wheels, which will take them on a tour through Europe right after the event. In this issue's Mille-Miglia Special, you will find out which events and exhibitions you can see them at and how BMW accomplished the great success in 1940.

This is, however, not the only thing we want to celebrate. March saw the presentation of the sixth-generation BMW 5 Series. Launched in 1972, the BMW 5 Series laid the foundations for BMW's well-known classification of model types, and has since become one of the world's most successful business saloons. In this issue, we will introduce you to all BMW 5 Series generations, as well as the numerous innovations they feature.

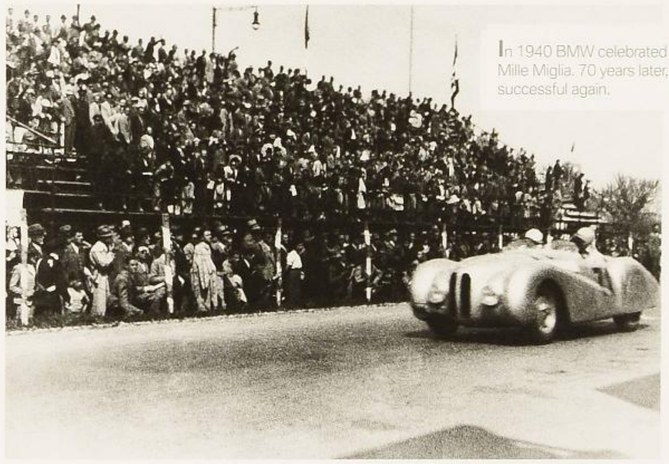
More innovations can be admired in the BMW Museum, which is participating in the travelling exhibition "Museums in the 21st century. Ideas Projects Buildings". From May, you can experience this spectacular show of contemporary museum models from all over the world in the temporary exhibition at the BMW Museum.

Now, I wish you lots of enjoyment reading these and many more fascinating stories and a successful year with the blue-and-white brand.

Best wishes,

Karl Baumer

Director of BMW Group Classic, BMW Museum and BMW Welt



In 1940 BMW celebrated the overall victory at the legendary Mille Miglia. 70 years later, BMW Classic wants to be successful again.

» 54

CLASSIC NEWS

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AUTOMOBILES

MOTORSPORT

REGULARS

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23 – 25 April 2010, Cernobbio, Italy

Concorso d'Eleganza Villa d'Este

The Concorso d'Eleganza is one of the most renowned beauty contests for classic vehicles and concept cars and goes back to 1929. Since 1999, the event has been organized under the patronage of BMW Group. In 2010 some 50 historic cars and a selection of extravagant contemporary concept cars will wow the international audience once again. The original BMW 328 Mille Miglia Roadster Series I (the "trouser crease" roadster) will also take part in the contest. Traditionally, there is public access to the vehicles and exhibitions on Sunday. **www.concorsodeleganzavilladeste.com**

BMW Welt Jazz Award

Under the motto "Joy sings. Voices in jazz", BMW Welt once again presents an award to outstanding jazz artists. The participants, Theo Bleckmann & Ben Monder Duo, Michael Schiefel & Carsten Daerr, Cécile Verny Quartet, Maria De Fatima, Alony, and the Youn Sun Nah & Ulf Wakenius Duo, will compete in six Sunday matinees to win a place in the final, when two will face off against each other. Tickets are available at BMW Welt or at **www.muenchen-ticket.de**

17 April 2010, 8 pm, Auditorium
BMW Welt, Munich, Germany

Gaisberg Race

BMW is a sponsor of the eighth regularity race. Entry conditions only allow vehicles made before, and in, 1969. BMW Classic will enter five vehicles: four BMW 328 models and one BMW 700 RS. Their drivers will include Dieter Quester and Prince Leopold of Bavaria, amongst others. There will also be an exhibition of the BMW 328 cars that won the legendary 1940 Mille Miglia at the "Residenzplatz" in Salzburg. **www.src.co.at**

2 – 5 June 2010, Salzburg, Austria

BMW Motorcycle Days

Happy Birthday BMW Motorcycle Days! This year, more than 30,000 birthday guests are expected to attend the 10th anniversary. The world's biggest BMW motorcycle party will also celebrate the GS models' 30th birthday. As well as test drives and training with current motorcycles, the programme includes stunt shows, show races, and, of course, the legendary parties.

www.bmw-motorrad.de/bikermeeting

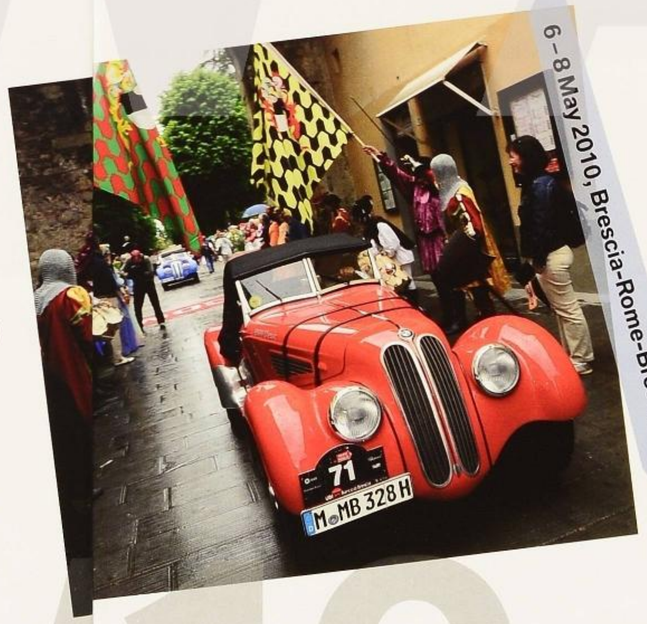
30 April – 11 May 2010, Oberstaufen, Germany

Allgaeu Orient Rally

Described by its organizers as "one of the world's last automobile adventures", the rally involves about 100 teams of up to three vehicles. From the line up in Allgaeu they drive across Europe via Turkey to Jordan. Only vehicles that are older than 20 years or that are no longer worth more than 1111.11 euros are allowed to participate. The first prize is a camel. The vehicles are then donated to charity in Jordan. The United Nations are the rally's patron. BMW Classic will field three vehicles: one BMW 5, one BMW 6, and one BMW 7, each from the first generation. **www.allgaeu-orient.de**

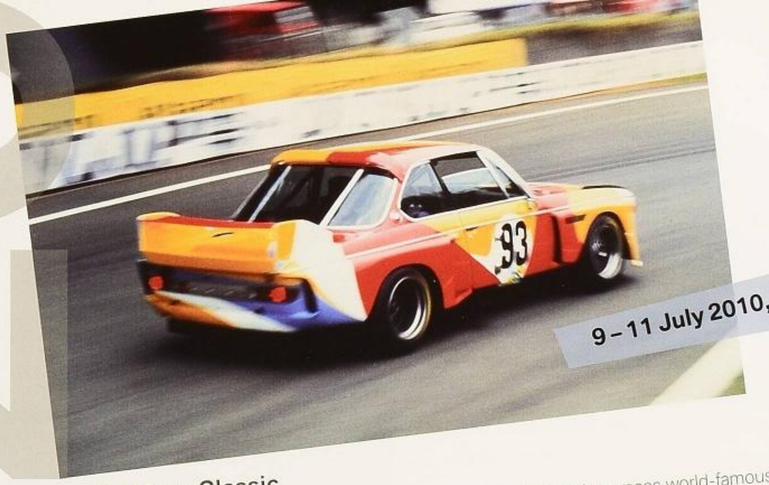
Mille Miglia

70 years after its victory, the BMW 328 Touring Coupé will line up at the Mille Miglia once again. BMW Classic will enter this year's race with around a dozen BMW 328 models. More information on this can be found on page 54 of this issue. **www.millemiglia.it**



6 – 8 May 2010, Brescia-Rome-Brescia, Italy

2 – 4 July 2010, Garmisch-Partenkirchen, Germany



9 – 11 July 2010, Le Mans, France

Le Mans Classic

24 hours of pushing at the limit: this motto has made the Le Mans races world-famous since 1923. The historical edition celebrates the comeback of race classics. Some 400 cars in six classes will battle it out for victory at the event, which takes place every other year. Together with BMW France, BMW Classic will present models of the brand from the history of Le Mans such as BMW M1 and several BMW Art Cars.

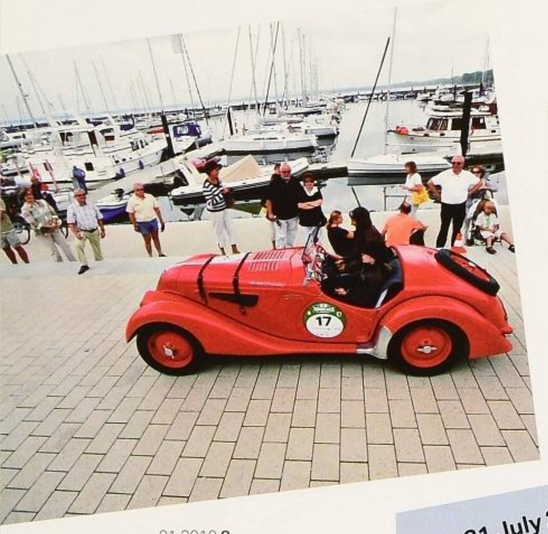
www.lemansclassic.com

14 – 17 July 2010, Gröbming, Austria

Ennstal-Classic

Under the motto "driving in the last paradise", the Ennstal Classic in Styria, Austria, has been attracting classic car fans and former race drivers for 18 years. The rally takes drivers over mountains and through valleys, such as the Gröbminger Stoderzinken and the Postalm mountains. In 2010, BMW Classic will put four BMW 328 race cars and one March 712 BMW from 1971 up; their drivers will include BMW Motorsport Director, Prof. Mario Theissen, among others.

www.ennstal-classic.at



Hamburg-Berlin Classic Rally

After only two years, the Hamburg-Berlin Classic Rally has secured itself a well-established position on the race agenda. The regularity and reliability rally takes three days and runs from Hamburg via Wolfsburg to Berlin. Altogether, participants have to tackle a course of about 650 km. BMW Classic will field five vehicles: three regular BMW 328 models and the BMW 328 Mille Miglia Touring Coupé and Roadster. 180 teams take part in the race, and no vehicles built after 1990 are admitted.

www.hamburg-berlin-klassik.de

29 – 31 July 2010, Northern Germany

AvD Oldtimer Grand-Prix

The AvD Oldtimer Grand Prix 2010 is nothing like a regularity race. At the Nürburgring, the classic race-cars fight hard battles. More than 600 vehicles from eight decades will participate in the 38th event. Another thousand classics will line the track and the parking lots along the circuit in the Eifel. In addition to the MINI Challenge, numerous original BMW race vehicles from the 1970s and 1980s will also line up in several rounds. **www.avd.de/ogpracing**

13 – 15 August 2010, Nürburgring, Germany

Goodwood Revival

This year, the Goodwood Revival expects more than 130,000 spectators to visit the world's greatest historical motor sports event. Some 400 vehicles from the years 1948-1966 will race each other. But the classics will not be the only stars – spectators also dress up, usually in contemporary outfits. The event is also a hotspot for stars and starlets. BMW Group Classic will also make an authentic appearance and enter race classics on two and four wheels.

www.goodwood.co.uk

17 – 19 September 2010, Goodwood, United Kingdom

15 – 21 September 2010, Northern Germany

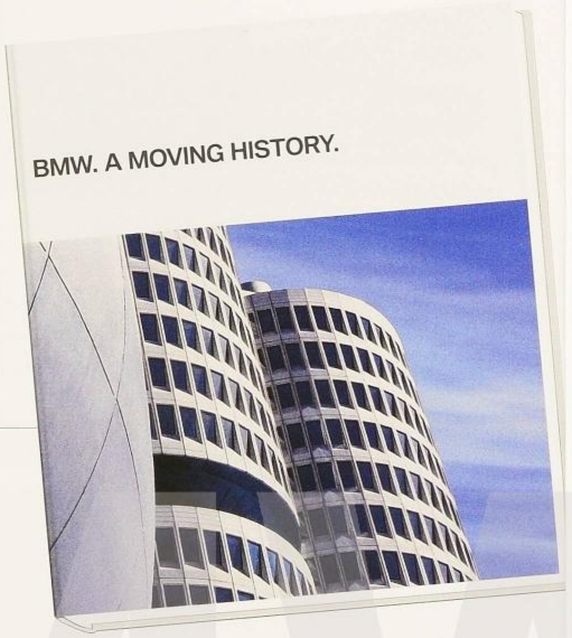
Creme 21 Youngtimer Rally

Named after a cult cosmetic brand from the 1970s, the Youngtimer Rally has firmly established itself on the events calendar. The rally lasts several days and takes participants through a different region every year – in 2010 through Northern Germany. Only vehicles between 21 and 40 years old are permitted to take part in the rally. BMW Classic will compete with a first generation BMW M3. **www.creme21-rallye.de**

Brief and compact

BMW started as a small aircraft engine manufacturer; today, it is the world's largest supplier of premium automobiles and motorcycles. A new thirty-page publication illustrated with historical photos briefly and clearly shows which challenges were mastered, chances seized, and successes celebrated in more than 90 years of BMW history. The booklet is part of the new series "BMW Classic compact". The series introduces readers to key issues of BMW's history in a compact format.

This brochure on the company history is available for € 5.00 euros from BMW dealerships, or in Munich from either the BMW Classic Shop, Schleißheimer St. 416, or in the shop of the BMW Museum. **www.bmw-classic.com**



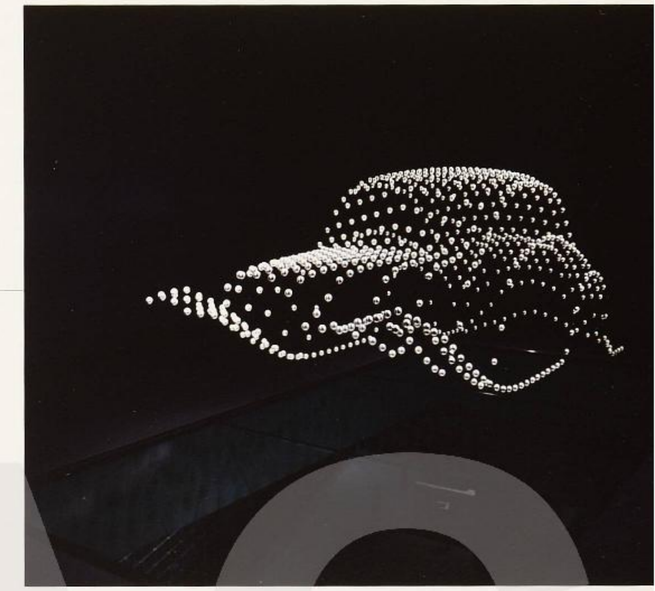
Please board

Come aboard and get to know Munich at its best. The BMW Museum offers limited tours with a chauffeur in exclusive classics of the brand. Starting from the Museum, the tour takes passengers to the BMW Welt, the BMW Plant, and BMW Classic's historical vehicle collection. After a light bite, the chauffeur continues down Leopoldstraße to Odeonsplatz and along the Altstadtring ring road, allowing passengers to discover the sights of the Munich's city centre through the windows of a luxury automobile. Finally, passengers can enjoy a champagne reception at BMW's flagship showroom at Lenbachplatz square. The tour lasts about three hours and finishes at the BMW Museum. Of course, this includes entrance to the BMW Museum and the museum guide.

Sightseeing tours are available in, among others, a BMW 326 convertible, a BMW 335 convertible, or a BMW 502 depending on availability and weather. The tour operates every first and third Sunday of the month as well as on special public holidays. It begins at 11 am and 3 pm. The price per seat: € 90.00. Reservations: 01802-118822 (6 cents/call from German landlines). **www.bmw-museum.com**

Modern art

The Kinetic Sculpture is one of last year's most successful art projects. The mechatronic art installation, developed by the agency Art + Com, received first prize at almost all major creative competitions in 2009. The crowd-puller, which symbolizes the creative form-finding process in automobile design, can be seen in the first room of the BMW Museum – and now it can also be seen on your computer.
Go to **www.bmw-museum.com** to download the interactive screensaver and enjoy the Kinetic Sculpture from home.



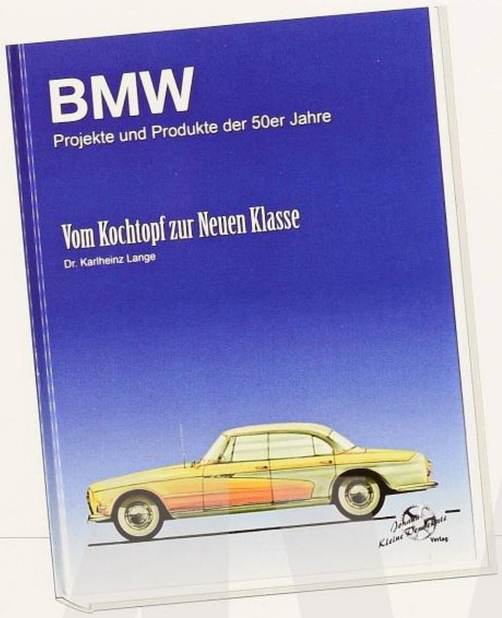
Family (Sun)day

Every last Sunday of the month is a family day. BMW Museum and BMW Welt are continuing this offer in 2010. Reduced admission, free tours, and a varying agenda offer exciting and entertaining experiences. Families only pay half price (€ 12.00 instead of € 24.00). The Museum also offers a variety of creative workshops for children of different age groups, led by qualified personnel. BMW Welt also has a junior campus where parents can experience the world of mobility with their children. A special highlight on certain Sundays is the traffic training for children, a playful class for the little ones to learn traffic rules. **www.bmw-welt.com**

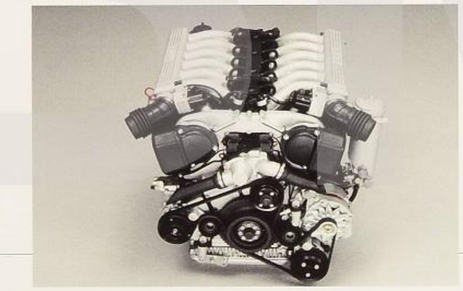
From cooking pots to the New Class

BMW 531, BMW 504, BMW R 10 – if you would like to know what lies behind these projects, you need the book "BMW. Projekte und Produkte der 50er Jahre". In his latest work, automobile expert Dr Karlheinz Lange describes BMW's production history in the 1950s. In addition to the well-known models BMW Isetta, 503, 507, and various motorcycles, the book also includes outlines, drawings, and photos of projects that were never realized and products that did not make it to series production. Lange establishes links between the projects and the company's overall situation. At the same time, he sets the situation against the political background of Germany and the world.

BMW. Projekte und Produkte der 50er Jahre.
Vom Kochtopf zur Neuen Klasse.
ISBN: 978-3-935517-51-5
Johann Kleine Vennekate publishing house, Lemgo, 2010



More parts



BMW Classic's part supply is growing. In 2010 the specialists have assumed responsibility for 6,700 parts of the second BMW 7 Series and 4,700 parts of the K model line (2-valves), and the BMW R model line (2-valves, boxer). This has raised the total stock of parts to almost 35,000. As always, customers can get original BMW parts for their classic vehicles from BMW dealers. All available parts can be looked into online at **www.bmw-classic.com/parts**

Movie stars

It was snowing and bitterly cold. Nevertheless, the guests of the 60th Berlin Film Festival (Berlinale) in 2010 were in high spirits on the opening night. BMW, the main partner of the Berlinale, had come up with a special idea for this evening, the gala premieres and the presentation of the awards: Tilda Swinton, Jürgen Vogel (on the picture) and the other stars did not have to walk the red carpet. Befitting their status, they were driven down the carpet in modern BMW models and classic vehicles from BMW Classic's collection. The classics, including BMW 507, BMW Isetta, BMW 502 "Isar 12", BMW M1, and BMW Z8, have all had their own movie careers.
www.bmw-classic.com

Passion lasts forever

Youngtimers (the German name for modern classics) are en vogue. More and more people are developing a passion for vehicles from the 1970s and 1980s. The 02 models, the first generation of the 3, 5, and 7 Series, and the GS two-wheelers – a variety of BMW vehicles are already classed as Youngtimers. BMW Classic is making sure that they will continue to provide driving pleasure for along time with some new offers: all BMW two, three and four wheelers up to the second 7 Series can be repaired, restored, or simply serviced for fair prices at the BMW Classic Center. BMW Classic experts also take care of buying and selling classic vehicles, and providing vehicle expertise and buying advice. The great advantage of the manufacturer is that it can guarantee the supply of original BMW parts for a variety of Youngtimers and classics.
BMW Classic is currently running a broad campaign to promote its new services and offers. The advertisement motives will feature selected Youngtimers.
www.bmw-classic.com

South Africa in the BMW Museum

By the time the World Championship kicks off in South Africa, the country will already be a guest in the BMW Museum. The BMW Art Car, painted by South African artist Esther Mahlangu, will be showcased in the "visions" area from May until November 2010. Like Jenny Holzer's show, the exhibition will include additional works of art and photographs. The Art Car is a BMW 525i from 1991, painted in the style of the colourful tradition of the Ndebele tribe.
www.bmw-museum.com

5 WINS.

FOR THE SIXTH TIME.

The BMW 5 Series has become one of the most important model lines in the brand's product range. The combination of dynamics, elegance, comfort, and safety makes the BMW 5 very popular and one of the world's most successful business saloons. Since 1972, more than 5.5 million vehicles from five model generations have rolled off the assembly line. Since then, the BMW 5 Series has been setting benchmarks in its class and intimidating the competition.

By Niklas Drechsler Photos BMW AG

1972

1ST GENERATION

The Watergate scandal was causing a stir in the USA. West Germany and East Germany were becoming closer, Munich was hosting the Olympic Games, and both the BMW Tower – the new BMW headquarters – and the BMW Museum were about to be completed. It was during this eventful year that the first BMW 5 Series came onto the scene. It was the successor of the extremely successful "New Class". From 1961, BMW sold about 350,000 units of these four-door touring saloons, thus making the New Class BMW's second-best-selling model line at the time. It laid the foundations for BMW to build its reputation as a manufacturer of sporty, elegant, efficient, technically innovative, and comfortable four-door mid-range models. With the launch of the 5 Series, BMW strove to take over the leadership in this market segment.

The first BMW 5 Series was the first series to be named according to a new system. Previously, the names for the different type-designations within one model line, such as 2800 and 3.0 S for big saloons, were only meaningful to insiders. The new model designations were now standardized. For example, the first representative of the new BMW 5 Series was called BMW 520: "5" stands for the middle-sized model line; "20" refers to the 2.0 litres of engine displacement. BMW later assigned the "3" to the small-sized model line and the "7" to the large-sized line. Even numbers are reserved for special versions, for example coupés such as the BMW 6 Series in 1976.

Initially, the 5 Series was launched with 4-cylinder engines. One year later, BMW extended the range with models fitted with typical BMW 6-cylinder engines featuring 2.5 or 2.8 litre displacement; in 1977 they added a smaller 6-cylinder engine with 2.0 litre displacement. In the following years, BMW intensively boasted in its adverts that it was able to offer an engine with just 2.0 litre displacement, but the same comfort as a 6-cylinder engine. For many years, this engine set the benchmark for running smoothness. A particularly sporty model was launched in 1980: the BMW M535i. Even today's drivers of this model are surprised by how nippy the powerful 218 hp engine is to drive. Owing not least to its relatively low weight of just 1,430 kg. This BMW 5, designed under the direction of Design Director Paul Bracq, was given a clear, dynamic form, large windows, and a deep waistline. This first 5 Series was initially manufactured in BMW's parent plant in Munich; production was moved to Dingolfing in Lower Bavaria in 1973, which has been Germany's only production site for the BMW 5 Series ever since. After nine years and the production of just under 700,000 units, its successor came on to the market.

During the design of the second generation BMW 5 Series BMW relentlessly continued to pursue the original concept. Consequently, the second generation is still widely regarded to be a larger make-over of the first generation – it was, in fact, a completely new design: its rear was considerably more distinctive and the double headlights had been resized. In addition, BMW gave it a new front axle and also implemented cutting-edge technologies, such as an anti-lock braking system, Check Control, and digital engine electronics. Like all generations of the BMW 5 Series, this one also featured a unique combination of comfort and driving dynamics.

↑ ABOVE The first generation BMW 5 Series boosted BMW's sales figures in the upper middle class.

Of the numerous engine variants, there are three that particularly stand out today: the BMW 524td, launched in 1984, was the first BMW production automobile equipped with a diesel engine. The turbulence-chamber engine features exhaust-gas turbo charging and digital diesel injection – an advanced engine management. At the time, the 524td was the world's fastest production vehicle with a diesel engine. (see p. 24)

The BMW 525e was the first car in Europe to be equipped with the BMW eta engine, which BMW had already successfully launched in the USA and Japan. "eta" (the Greek letter eta is the symbol for the degree of efficiency) is an intelligent concept to improve engine efficiency, which saves fuel by improving the degree of efficiency. With 2.7-litre displacement the engine produces, depending on the version, 122 – 129 hp at just 4,250 rpm. The BMW's 2.0 litre engine, which was common at the time, delivered 129 hp as well, but only at 6,000 rpm. Today, this concept is recognized as having been far ahead of its times.

The second-generation BMW 5 Series was the first to include an M model. Built by BMW M GmbH, and based on the 5 Series, the BMW M5 was, and still is today, the embodiment of understatement. The car magazine "auto revue" wrote the following at the time: "In a group of squirrels thumping their chests and thinking they are the strongest in the woods, this car is a bear". With an output of 286 hp, the four-door saloon achieved a road performance that only sports cars delivered back then. Journalists frequently referred to the "original M5" as a wolf in sheep's clothing.

1981

1987

The BMW 5 Series established itself as a high-tech vehicle in the upper mid-range when the third generation was launched in 1987. Boasting numerous intelligent innovations such as a cutting-edge digital-engine management system, ellipsoid headlights, and central locking with infrared remote control, the saloons left the competition standing. These innovations were also features of the touring variant unveiled in 1991. Features such as a rear windscreen that could be opened separately have been enhancing everyday driving ever since.

This generation BMW 5 Series focussed more on aerodynamics. It boasted a cd value of only 0.30 – outstanding for its time. The vehicle also came off well with regard to safety. Assessing a crash test with a BMW 520i the magazine "auto, motor und sport" concluded the following: "Altogether, the BMW 520i achieved the most balanced result of all tested mid-range cars."

Initially, this generation 5 Series only came with 6-cylinder in-line engines; from 1993, BMW completed the lower end of the range with an entry model for beginner and fleet customers, the BMW 518i with a 4-cylinder in-line engine, and the upper end with the addition of two variants featuring V8 engines with aluminium crankcases. As well as camshafts provided with compensation weights for improved counterbalance, they featured "cracked" connecting rods made of sinter metal allowing for even further enhanced running smoothness. The BMW 525iX was the first model with four-wheel drive added to the model range; and the BMW 518g Touring the first model from a large-scale manufacturer driven by a natural-gas engine.

The tried-and-tested 6-cylinder engines were also improved: the diesel engine in the BMW 525tds featured an intercooler and the BMW M5 featured metal catalysts, reducing exhaust gas back pressure considerably more than conventional systems, causing hardly any engine performance loss.

The design of the third generation BMW 5 Series differs from its predecessors, taking after the second generation BMW 7 Series. The longer car has more room in the passenger compartment and a smoother design. Thanks to its appearance, coupled with the familiar, reliable, and efficient technology, BMW sold more than 1.3 million vehicles of the third generation. It is still regarded as an excellent touring saloon today.

4TH GENERATION

1995

5TH GENERATION

2003

→ RIGHT A new design gave the fifth generation BMW 5 more distinctive profile.

The same is true for the fourth generation: it was still considered to set benchmarks in quality and innovations long after it was in production (1995-2003). When the magazine "auto, motor und sport" tested the BMW 523i, it concluded: "Reversing the words of Erich Kästner's poem "Wo bleibt das Positive?" (Where is the positive about it?), we're asking: What is negative about the new BMW 5? The answer is the same as that given in his original poem – so where is it?". Critics struggled to find fault with the design. It was slightly rounder, but still sporty and elegant, thus continuing BMW's successful tradition. Although this generation BMW 5 was a somewhat longer than its predecessor, at the same time it also seemed more compact. The double headlights, fitted behind one common glass cover, were especially eye-catching at first glance.

But the real sensation was the first mass-produced chassis to be made completely from light metal, rendering it 65 kg lighter than conventional constructions. Despite featuring new safety and comfort features, the saloon was lighter than its predecessor. This was, in part, thanks to the first BMW 6-cylinder in-line engines to be manufactured entirely from aluminium.

In addition to the 6-cylinder engines, this generation also included V8 models, as well as a powerful BMW M5 boasting 400 hp. During the production cycle, more technical innovations were added to the petrol-operated engines, including double VANOS and fully electronic throttle butterfly control. The diesel engines were equipped with common-rail injection technology and variable turbine geometry.

In 1997, BMW launched the touring models, featuring a specifically developed space-saving and particularly light compact aluminium rear axle. This revolutionary rear axle construction allows for a flat boot floor and completely straight side panels in the boot with no suspension strut mountings to get in the way. The straight side panels facilitate use of the luggage compartment and enable the installation of a pull-out boot floor; this can also withstand heavy goods and is much easier to load than a conventional boot.

As per its predecessors, once again special attention was given to safety. After a frontal offset test crash at 55 km/h, "auto, motor und sport" concluded: "All forces acting on the passengers are far below their relevant limits, so there is no real risk of injury whatsoever". The outstanding safety of this BMW 5 is cemented by further innovations: in the event of a crash the battery clamp jumps, thus preventing a short circuit, which could cause a fire. All cars manufactured after 1998 not only come with airbags for the driver and front passenger, as well as side airbags in the front and back doors, but they also come with ITS head airbags protecting passengers from head injury in the case of a lateral collision. Active safety features, such as Dynamic Stability Control (DSC) – also known as "ESP" – help to prevent accidents.

6TH GENERATION

Dynamics at its best

From now on you can experience the new BMW 5 Saloon at BMW Welt. The special show in the Double Cone includes several models and innovative exhibits.
BMW Welt, Am Olympiapark 1,
80809 Munich, www.bmw-welt.com

4 questions for Josef Wüst

Project manager of the new BMW 5 Series

Mr Wüst, the BMW 5 Series is one of the most successful business saloons in the world. What do you expect from the new model?
BMW has sold 5.5 million 5 Series vehicles since 1972. With the new model, we will continue, or even exceed, the success of its predecessors.

The BMW 5 is regarded as being particularly innovative. Which innovations are features of this new model?
The new BMW 5 Saloon features a completely new chassis, which is also a mark of the new BMW 7 Series and the BMW 5 Gran Turismo. This generation BMW 5 Series is the first to come with an electromechanical steering system as standard. Combined with integral active front steering, the BMW 5 now drives as nimbly as a BMW 3. We have achieved excellent consumption values and driving dynamics, in accordance with our EfficientDynamics strategy, by combining automatic 8-gear transmission, efficient engines, active air flap control, tyres with reduced rolling resistance, and Brake Energy Regeneration. Regarding advanced driver assistance systems, the new BMW 5 offers everything available in the BMW 7; this includes a lane departure warning system, ACC Stop & Go with brake support, a Head Up Display, and much more. On top of this, the new BMW 5 is the first to feature the BMW park assistant system and Surround View.

The design deserves particular attention. What is special about it?
The design is special because of its perfect proportions. We have increased the overall length and wheelbase, resulting in shorter overhangs. The vehicle looks extremely sporty, stylish, and elegant – just like a tailor-made suit.
The sporty front with vertical grilles and a long bonnet with distinctive lines and double round headlights give the vehicle a charismatic look. The side view is elegant and coupé-like, supported by a distinctive Hofmeister kink and the elegant roofline. Horizontal lines emphasizing the vehicle's width dominate the rear view of the vehicle, reinforced by its distinctive L-shaped taillights with their stretched bodies.

How did BMW's history influence the development of the new BMW 5?
The design in particular is taken from BMW's history. For example, the slightly overhanging grilles are a distinctive characteristic of BMW referred to as "shark nose". The sharp Hofmeister kink and the slim C-column are also typical features from BMW's history.

The fourth-generation even outnumbered the successful sales figures of its predecessor, with almost 1.5 million models having been manufactured.

In 2003, BMW launched yet another cutting-edge technology leader, the fifth generation, which boasted a variety of innovations. All 5 Series cars have featured BMW EfficientDynamics measures as standard since 2007. Thanks to brake energy regeneration and a gearshift point indicator, among other things, the BMW 5 redefined efficiency in its class. The BMW 520d, for example, achieves a low consumption of 5.1 litres per 100 km with a performance of 177 hp (EU test cycle).

All these innovations have the objective to render the 5 Series even more efficient. The 6-cylinder petrol engines are the first in automobile production to feature a magnesium-aluminium composite crankcase. The electronic water pump control is only activated when the engine actually needs to be cooled, thereby saving fuel and shortening the warm-up time. During production all petrol engines are equipped with VALVETRONIC. This fully variable control of the inlet valve lift regulates engine output directly via the inlet valves, rather than via the throttle body as previously, saving 10 to 15% of fuel. The diesel engines are equipped with variable twin-turbo technology for the first time, consisting of one small and one large turbocharger, which are arranged sequentially, in order to develop the highest possible torque at all speed ranges.

The chassis was also developed further. The roll stabilization system Dynamic Drive, as well as Active Front Steering, allowed for an even more agile road performance, further improved by the lightweight measures for the bodywork, such as the light-weight aluminium front structure (GRAV) and the bonnet and side panels made of aluminium. These measures not only reduce the weight but also contribute to achieving a balanced axle load distribution of close to 50:50.

The most striking innovation on the inside is the iDrive operating concept, a modified version of which was also adopted by other manufacturers much later. It was the same for the colour Head-Up Display, which had its worldwide debut in the upper mid-range in this generation 5 Series.

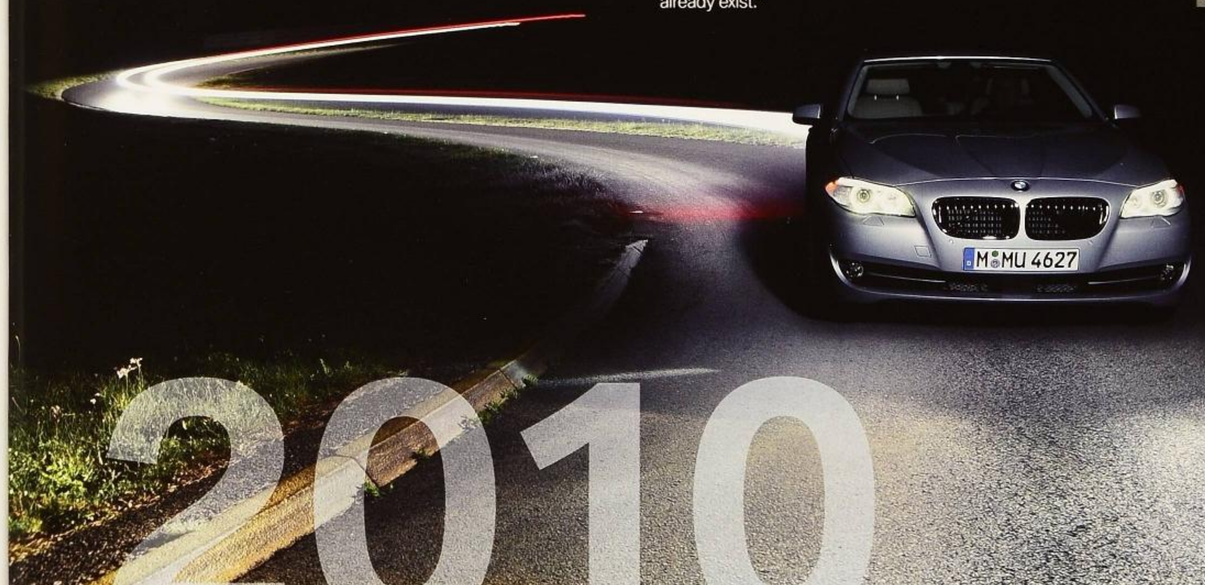
The BMW M5 version deserves special attention: it is available as a saloon and a touring model. It also features the combination of a naturally aspirated V10 engine, a 7-gear sequential transmission, and a differential lock with a lock value fully variable from 0-100 % – the models set new standards in their competitive environment.

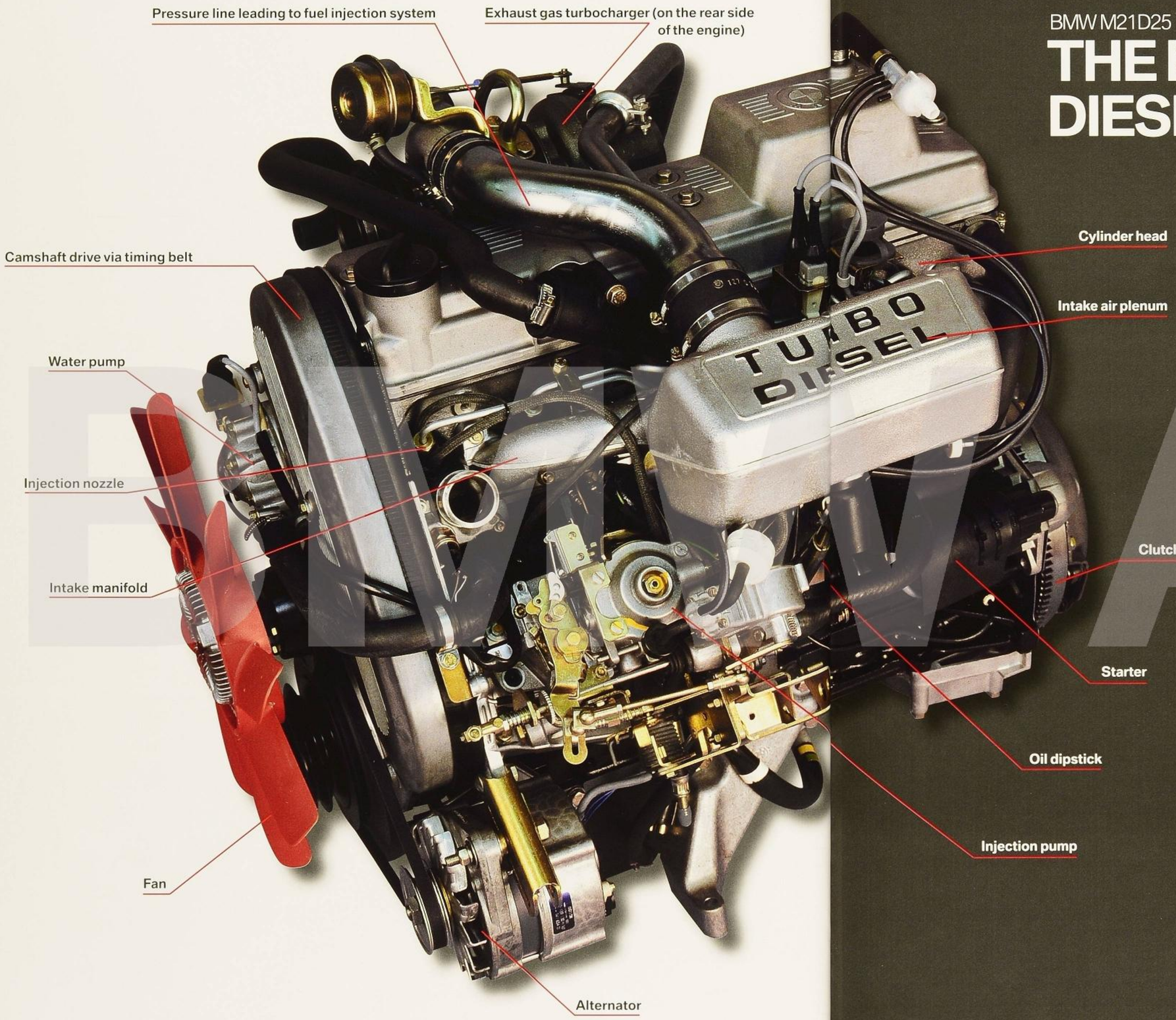
The design is progressive, and a little provocative. The convex and concave surfaces bear the signature of Design Chief Chris Bangle; "unconventional" as the magazine "auto, motor und sport" called it in 2003. From 2005, the fifth-generation BMW 5 Series was the top-selling vehicle in its class four years in a row.

The sixth-generation BMW 5 Series, launched in March 2010, features cutting-edge engine and chassis technology, enhancing its outstanding sportiness and improving comfort. The BMW 5 saloon is available with one 8-cylinder and three 6-cylinder petrol engines, as well as with two 6-cylinder diesel engines. A 4-cylinder turbo diesel engine with aluminium crankcase and common-rail direct injection completes the range. The engine produces 184 hp, bringing the BMW 520d, standard-equipped with Auto Start Stop function, new optimum efficiency values in its segment. According to EU5, tests showed an average consumption of 5.0 litres per 100 kilometres.

The top-of-the-range BMW 550i model is powered by an 8-cylinder engine, which has an output of 407 hp and features BMW TwinPower Turbo Technology, as well as the gasoline direct injection system High Precision Injection. The powerful 6-cylinder inline engine in the BMW 535i is particularly worthy of mention – it has an output of 306 hp, and is also the first model to feature a combination of BMW TwinPower turbo, High Precision Injection, and VALVETRONIC.

Unlike the design of the fifth generation, which is still a divisive subject, opinions on the new generation are unanimous: under the headline "Return to old virtues", spiegel.de wrote, "The bodywork of the new model has a conciliatory design. The details, the proportions, the surfaces, and the edges all blend to create a consistent and elegant picture." The magazine "auto motor und sport" concluded: "Never fear! Number six has a good chance of superseding the 5.5 million BMW 5 models that already exist."





BMW M21D25

THE BRAND'S FIRST DIESEL ENGINE

BMW started developing diesel engines for cars comparatively late. The company's first production automobile fitted with a diesel engine, the BMW 524td, was only introduced in 1983. It was a sensation – the model was the fastest car with a diesel engine on the world market. For a long time, BMW had abstained from offering self-ignition engines, concluding that neither the lack of dynamics nor the problematic background noise of conventional diesel engines matched the brand's image. The powerful 2.4-litre turbo-diesel changed this. A weight-power ratio of 11.7 kg per hp, 115 hp at 4,800 rpm, a maximum speed of 180 km/h and an outstanding running smoothness ushered in a new era. The power unit built in BMW's engine plant in Steyr immediately set the benchmark for all diesel engines.

BMW had done a lot of research before finally deciding on a 6-cylinder in-line engine with turbulence chamber technology completely developed by BMW. This combustion method is not only highly efficient, but also achieves low fuel consumption, low pollutant evolution and fume emissions, as well as improved cold-start characteristics.

As is customary with diesel engines, the engine compression ratio was almost twice that of comparable petrol engines, at 22.0:1. In order to sustain higher loads, the diesel engine featured reinforced connecting rods, a forged crankshaft, and a reinforced upper crankcase cover. To increase the degree of efficiency, the exhaust fumes of cylinders 1-3 and those of cylinders 4-6, respectively, were combined and led to the turbine entry separately. This prevented exhaust gas streams from interfering with each other, thus allowing for the most efficient use of pulse energy from the gas streams. In 1987, the engine was enhanced with Digital Diesel Electronics, and the common bowden cable was replaced with an electronic accelerator pedal.

The magazine "auto, motor und sport" wrote: "We were able to get our first impression of driving a BMW 524td and have nothing but praise for the engine's characteristics. We were not only fascinated by the continuous unfolding of power and the refreshing temperament, unusual for diesel cars, of the youngest BMW newcomer, but much more by the fact that it delivers almost the same as BMW's petrol-operated six-cylinder engines with regard to noise emission and running smoothness".

By 1992, BMW had mounted about 260,000 units of the first diesel engine, including the naturally-aspirated variant available as of 1986. Since then, BMW has consistently offered diesel engines for almost all model lines – apparently with great success: in Europe, BMW sells today more diesel than petrol models.

THE DEVELOPMENT OF AERODYNAMICS AT BMW

SHAPED BY THE WIND

EfficientDynamics is a development strategy BMW AG pursues in order to render its vehicles not only more economical but also more dynamic. One central component of this strategy is the efficient aerodynamics of the BMW vehicles. BMW has shown a special expertise in this field for 80 years.

By Florian Moser **Photos** BMW AG

Big, wide, and angular, the first automobiles provided the wind with a big target. Vehicle engineers started only in the 1930s to take aerodynamic aspects into account in the development of series-production and motor sport vehicles. Thus aerodynamics became an object of extensive research, leading to the streamlined cars which characterized a whole era. The accelerated construction of the new motorways and the resulting higher travelling speeds stimulated an improvement in vehicle shapes, giving a new impetus to aerodynamic research, which had been carried out on a limited basis since the beginning of the 1920s.

In keeping with the spirit of the 1930s, BMW also started to put great effort into developing vehicles with a more aerodynamic design. For example, the standard equipment of the legendary sports car BMW 328, launched in 1936, included underside panelling, rear wheel covers, and integrated front headlights. The BMW 327/28 coupé from 1938 was also a classic streamlined car, sporting considerably improved aerodynamic properties compared to previous vehicles. Re-measurements in a BMW wind tunnel later showed a cd value of 0.50, whereas a BMW 303 from 1933 had a c_d value of 0.54.

However, at first, production automobiles did not consistently benefit from these early aerodynamic theories. In the beginning, they were primarily applied to prototype construction and motor sports. At that time, BMW co-operated very closely with Professor Wunibald Kamm (see box). Together, they conducted numerous wind tunnel experiments on BMW scale models (1:10) in Stuttgart, which were reflected in extremely successful BMW prototypes based on the BMW 328. The most prominent example is the BMW 328 "Kamm" Racing Saloon fielded at the Mille Miglia in 1940 (see next page).

The co-operation with Kamm was not, however, limited to unique motor sport models, but was also meant for implementation in production vehicles. The successor of the BMW 326, the most successful BMW automobile of the pre-war period, was intended to be the first production model to comprise aerodynamic features based on Kamm's research results. However, BMW only managed to build three prototypes of this BMW 332 in 1940, before the war stifled all further work.

BMW took a pioneering role in the motorcycle sector. For Ernst Jakob Henne's series of world records until 1937, BMW was the first to field a fully faired motorcycle. Thanks to the resulting optimized aerodynamics, Henne established the record for the flying kilometre at 279.5 km/h – a record performance that was to stand for 14 years.

World War II not only abruptly stopped BMW's development work, but also brought a general break in aerodynamics research. In the 20 years following the war, vehicle engineers, with rare exceptions, did not focus on aerodynamics. Nor did BMW. They did carry out measurements in external wind tunnels, but the results only served to document the values of already-developed cars.

→ RIGHT By 1937, Ernst Jakob Henne had established several world records on his powerful 500 cc motorcycle. According to aerodynamic research results of the time BMW had given the model full fairing.

$$p = p/2 \times v^2 \, [N/m^2]$$

In 1973, BMW made a statement when it offered optional aerodynamic add-ons for the lightweight coupé BMW 3.0 CSL: air-guiding devices on the fenders, a roof spoiler, and rear wings improved the aerodynamics and considerably reduced the lift at the rear axle. With a cd value of 0.39, the big coupé achieved a respectable airflow pattern.

In motorcycle construction BMW yet again reached a real milestone. The BMW R 100 RS, launched in 1976, was the world's first motorcycle to feature full fairing developed in the wind tunnel. Continuing this innovative tradition, BMW caused another sensation with the launch of the BMW K1 in 1989. Despite the upright position of the driver, the drag coefficient of 0.36 - 0.38 equalled that usually achieved only by sports motorcycles with the driver in a lying position.

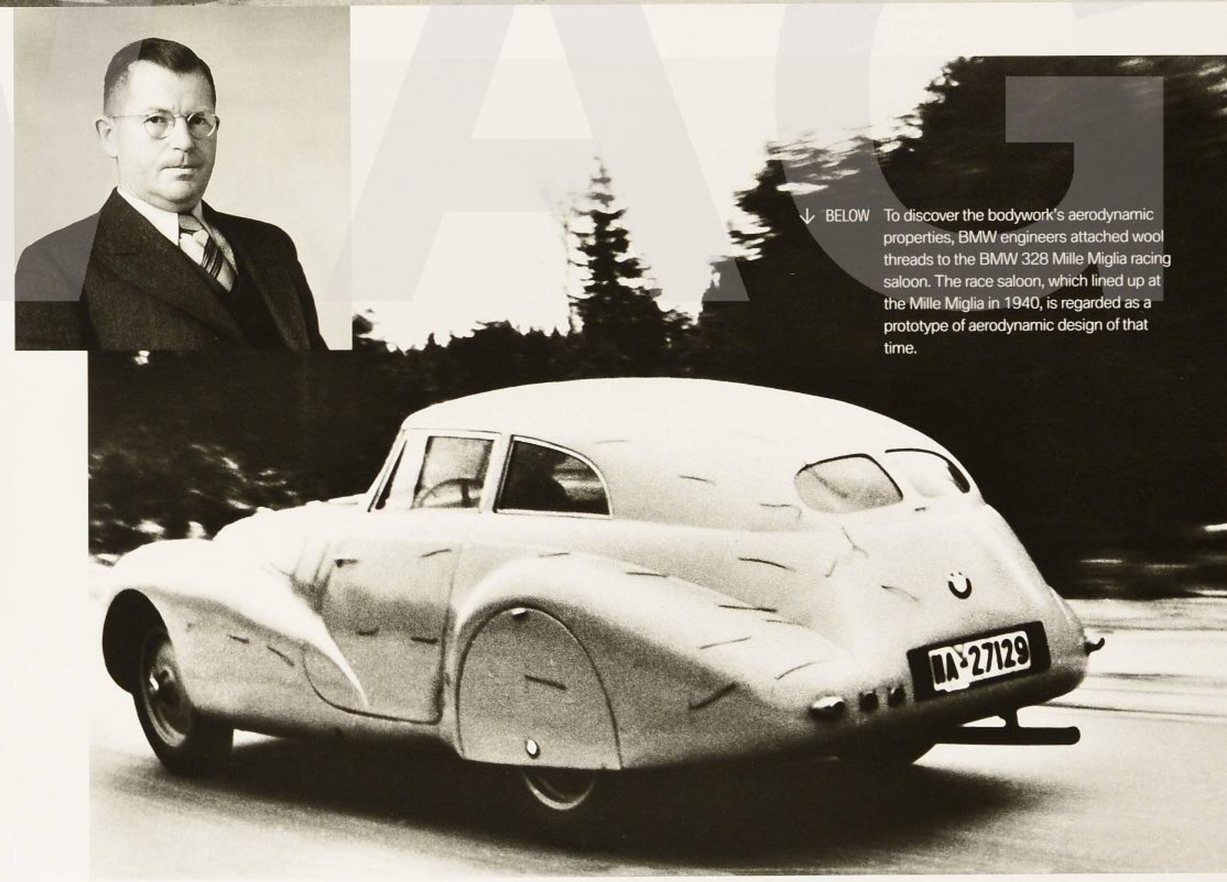
BMW had its breakthrough in aerodynamics for automobiles in the 1980s. Since then, it has ranked among the leading experts in vehicle aerodynamics. In the 1980s, BMW opened two wind tunnels of its own: in

WUNIBALD KAMM – PIONEER OF AERODYNAMICS

Professor Wunibald Kamm, from the Research Institute of Automotive Engineering and Vehicle Engines in Stuttgart (FKFS), was, together with the Jaray School from Switzerland, regarded as the most influential representative of streamlining research of his time. Among his most famous works is the "Kamm circle of forces", which represents the dynamic interaction between static friction, braking forces, acceleration forces, and lateral forces.

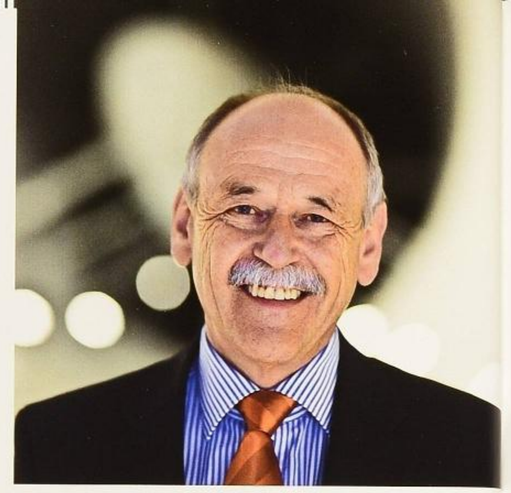
Kamm was responsible for the first blunt tail in bodywork design. Starting from the A column, the contour of the vehicle continuously tapers, but only to an extent that the flow is at all times abutting the vehicle. At a point shortly before the flow would break away, the tail is sharply truncated. Altogether, this design reduces turbulence and air resistance.

An outstanding result of the co-operation between Kamm and BMW is the BMW 328 Kamm Racing Saloon fielded at the Mille Miglia 1940. The streamlined body features a very prominent version of the "Kamm tail", which, together with the efficient 136 hp engine, enabled this high-tech racer to achieve a maximum speed of 230 km/h.



↓ BELOW To discover the bodywork's aerodynamic properties, BMW engineers attached wool threads to the BMW 328 Mille Miglia racing saloon. The race saloon, which lined up at the Mille Miglia in 1940, is regarded as a prototype of aerodynamic design of that time.

5 questions for Hans Kerschbaum
Former Director of Aerodynamics, BMW Group (until autumn 2009)



How important was vehicle aerodynamics at the time you joined BMW?
When I started working for BMW in 1977, the wind tunnel in Aschheim was under construction. But there was neither a team, nor a structure, not even a vision of how to incorporate vehicle aerodynamics. The vision came to us in the form of Lutz J. Janssen, who joined BMW in the early 1980s. Janssen had previously worked in the then very efficient aerodynamics department at VW under Dr Wolf-Heinrich Hucho and had many years of experience in this field.

How has working in aerodynamics changed over the years?
It was anything but a straight path, but over the years, we were able to build an efficient team of aerodynamics engineers. Moreover, unlike VW, we realized early on that an own and independent construction of models was crucial to the development of aerodynamics.

What does the future hold for aerodynamics engineering? Where do you still see room for improvement?
Modern methods and the development tools available to vehicle aerodynamics engineers have proven to be extremely efficient and are capable of coping with future challenges. One such challenge is, of course, to further reduce air resistance – including that of new, still-uncommon designs – and another is to further increase the driving and directional stability in synergy with the various control systems.

For 30 years, you influenced BMW's aerodynamics development like no one else has. What are you particularly proud of?
Today, BMW's vehicle development department includes a very efficient Center of Competence for aerodynamics. It is based on three major cornerstones:

- The new Aerodynamic Test Center hosting the world's two best wind tunnels and located in the middle of the BMW Group Research and Innovation Center, the FIZ.
- The independent aerodynamics model construction providing maximum freedom of design and flexibility.
- A top team of dedicated and highly motivated aerodynamics engineers.

This aerodynamics Center of Competence is unique and at the forefront of the entire vehicle industry. Together with my team, I got the chance to shape and accomplish all this during my professional career, and I am very proud of that.

What do you conclude after all this?
I am convinced that all of the aerodynamics department's achievements in reducing air resistance and increasing driving stability are a major contribution to energy efficiency, to ecology, to sustainability, and consequently to BMW's success. Based on this conviction and a big deal of persistence, we have turned visions into reality.

summer 1980 the BMW wind tunnel on the fair grounds in Aschheim, and in September 1989 an acoustic wind tunnel for BMW Technik GmbH.

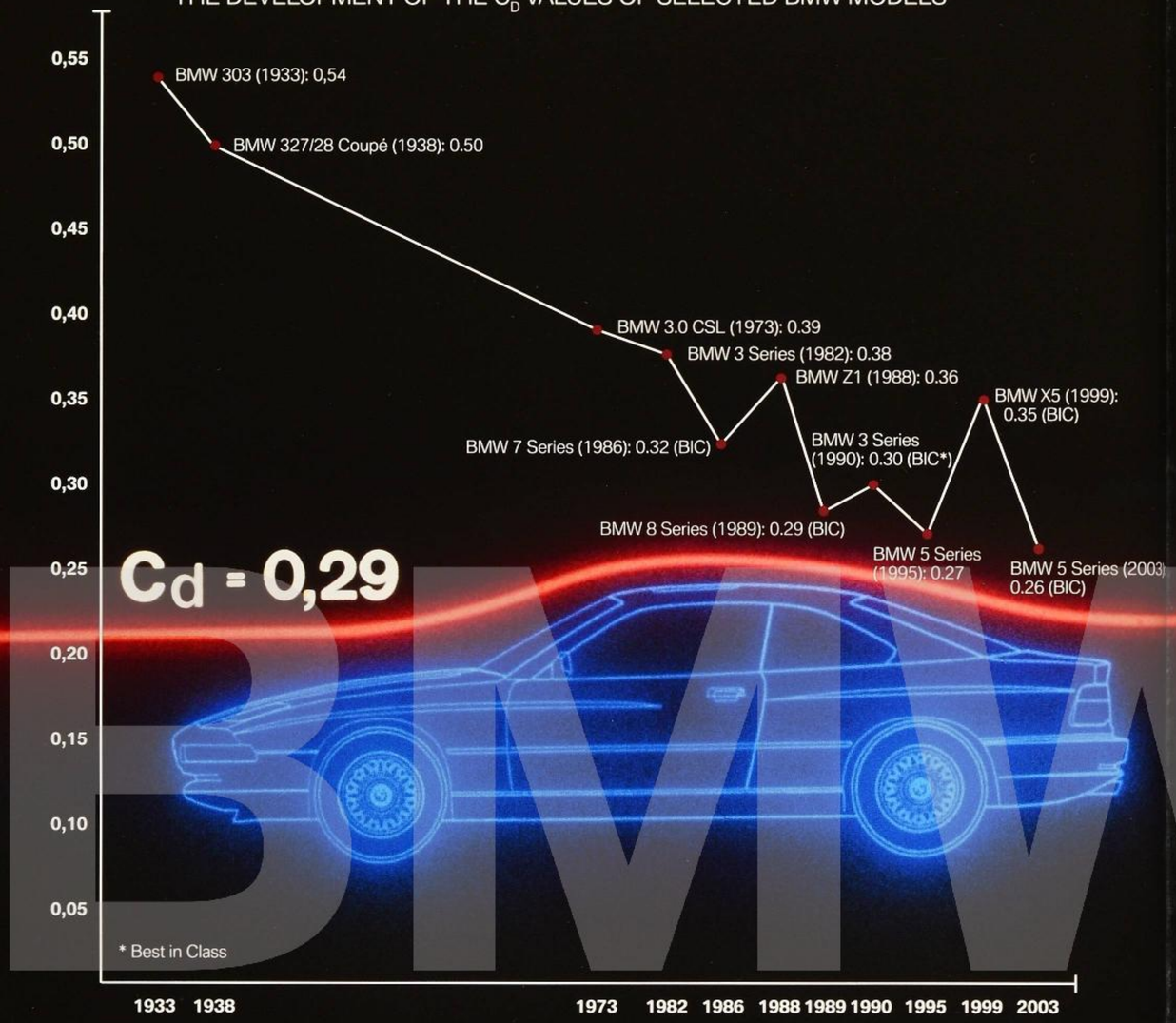
The first top-of-the-range aerodynamically-designed product was the second-generation BMW 7, launched in 1986. The close co-operation of aerodynamic engineers and designers bred excellent aerodynamics and a cd value of 0.32, which was to be the best cd value in its class for years. Further aerodynamic highlights soon followed: the BMW Z1 (1988), the BMW 5 Series (1988), the BMW 8 Series (1989), and only one year later, the third generation BMW 3 Series (1990).

Since the middle of the 1980s, BMW automobiles have regularly ranked among the best of their classes. Today, the title "Best in Class" is a declared development-objective for the large BMW X models and the volume models of the BMW 3 Series and 5 Series, in accordance with the BMW EfficientDynamics strategy. The new Aerodynamic Test Center (AVZ), opened in spring 2009 in the heart of BMW's development site in Munich, shows the significance BMW attaches to the future development of aerodynamics research. The two new wind tunnels equipped with state-of-the art wind tunnel technology now allow for realistic measurements – a prerequisite for creating further aerodynamic "masterpieces".

↓ BELOW The new Aerodynamic Test Center (AVZ), built in 2009 in the north of Munich, strengthened the development of aerodynamics, which is a major cornerstone of of BMW's EfficientDynamics. Here you can see the sports car study BMW Vision EfficientDynamics in the wind tunnel of the AVZ.

$$F_d = c_d \times A \times p$$

THE DEVELOPMENT OF THE C_D VALUES OF SELECTED BMW MODELS



↗ ABOVE Results of aerodynamics analyses: the third BMW 5 Saloon exhibits a c_d value of 0.30 – exactly like the third BMW 3 Series from 1990.

PRINCIPLES OF VEHICLE AERODYNAMICS

The drag force (F_d) of a vehicle depends on the following factors:

A: the projected frontal area of the vehicle, i.e. the surface orthogonal to the flow direction. It is specified in m^2.

c_d: the drag coefficient. It is the quality of the airflow pattern, dimensionless and independent of the vehicle size.

p: the dynamic pressure of the approaching flow. It depends on the density of air p (rho) and the velocity of the approaching flow v, as follows:

$$p = p/2 \times v^2 \ [N/m^2]$$

This leads to the following formula determining the drag force:

$$F_D = c_d \times A \times p$$

A vehicle manufacturer can only influence the c_d value and the projected area A. The rapidly increasing size of automobiles' front faces within the last decades has counteracted the significant progress made in improving the c_d value.

GLAS ON THE OUTSIDE
BMW ON THE INSIDE

Some automobiles and motorcycles that are sought-after classics today were less successful when they were in production. This was often due to economical, as well as aesthetical and technical reasons. The first part of this new series introduces the BMW 1600 GT from 1967. It was fast and beautiful, and a direct comparison left even the Porsche 912 standing. Nevertheless, this sports coupé was in production for only one year.

By Max Bauer · Photos BMW AG

AN ELEGANT CROSS-BREED

BMW 1600 GT

Engine: 4 cylinder in-line engine

Output: 77 kW/105 hp at 6000 rpm

Displacement: 1,573 cc

Top speed: 190 km/h

Dimensions (L x W x H): 4050 mm x 1550 mm x 1280 mm

Tank capacity: 55 litres

Consumption: 10.3 litres/100 km

Price new: 15,850 DM

How much do you have to pay for a BMW 1600 GT today?

Condition 1: € 24,000 Condition 2: € 16,500 Condition 3: € 11,000 Condition 4: € 6,000 Condition 5: € 2,700

(Estimated prices according to Olditax, the experts for classic vehicles, 2009)

In the 1960s, the New Class put BMW back on the road to success. The product range was, however, lacking a real sports car like the BMW 328 from the 1930s. When BMW purchased the engineering works Hans Glas GmbH Isaria in Dingolfing in 1967, the opportunity presented itself to fill this gap. The sports coupés Glas 1300 GT and 1700 GT had been designed by the Italian Pietro Frua and stood out particularly for their elegant and athletic silhouette. Back then, Paul G. Hahnemann, Sales Manager of BMW, explained: "The body design is excellent, except for some gimmicks such as the Goggo G at the cooler and the many little lights at the rear end looking like the teats of a wild sow".

The technology of these coupés, which Glas had already introduced at the International Motor Show IAA in 1963, was not, however, quite so well received in Munich. BMW therefore decided to take a courageous step: they developed the BMW 1600 GT, which was a cross-breed, a "blue and white hermaphrodite", as the leading german car magazine "auto motor und sport" called it at the time. The only elements remaining from the Glas coupés were the elegant body, the interior equipment, and the front axle. The heart of the sports coupé – the engine, the transmission and parts of the chassis – were adopted from the BMW 1600 TI. Instead of the 1700 cc four-cylinder engine made by Glas, the new BMW 1600 GT was equipped with the BMW four-cylinder engine taken from the BMW 1600 TI. Despite having a smaller displacement, it boasted more efficiency and performance than its predecessor. Under the management of former BMW Design Chief Wilhelm Hofmeister, the 2+2 seater was given essential BMW design elements, such as the grill, the blue-and-white emblem, the round rear lights of the 1600, and wheel covers featuring the BMW emblem. The transmission, clutch, and propeller shaft were also adopted from the BMW 1600. To increase driving safety, the semi-trailing-arm rear axle was equipped with an independent wheel suspension also taken from the BMW 1600, as well as with coil springs and double acting telescopic shock absorbers.

The high-performance engine gave the coupé the sprint qualities of a sports car. The 1,573 cc engine produced 105 hp at 6,000 rpm. Thanks to the lightweight all-steel bodywork, the coupé weighed only 960 kg, boasting a weight-to-power ratio of just 9.1 kg per hp. The Bavarian sports car managed to accelerate from 0 to 100 km/h in 11.2 seconds and reached a top speed of 190 km/h.

Compared directly with this modified sports car, even the Porsche 912, the little brother of the Porsche 911, was left standing. Although it featured the same displacement, the Porsche needed more than two seconds longer to accelerate to 100 km/h and only reached a top speed of 183 km/h. With a price tag of 16,980 DM, it was also more expensive than the BMW.

In 1968, BMW's press portfolio praised the new sports car as follows: "With the BMW 1600 GT, BMW has created a sports coupé that not only perfectly completes the range of fast BMW cars, but also contends with the world's most beautiful and exclusive Grand Tourisme models". The sports coupé was standard-equipped with a wooden steering wheel and

→ RIGHT The rear view, in particular, convinced those responsible at BMW to add the Glas Coupé to the product range as the BMW 1600 GT.

190km/h

↙ BELOW Thanks to the powerful BMW engine with an output of 105 hp, the competition hardly had a chance of keeping up with the sports coupé.

→ RIGHT Almost a real BMW during the reconstruction of the 1600 GT. It was fitted with grilles and the BMW emblem.

PIETRO FRUA (2/5/1913 – 28/6/1983)

In the 1950s and 1960s, Frua's design studio in Moncalierie near Turin was one of the most renowned in the automotive sector and was mentioned in the same breath as Bertone, Michelotti, and Pininfarina. Pietro Frua trained at Fiat, soon started his own business, and designed more than 200 models, prototypes, and custom-made products, as well as small-scale and large-scale production vehicles for a variety of automobile manufacturers. For the Glas Company, he designed not only the bodies of the GT models but also the bodies of the 1700 Sedan and the 2600 V8. Examples of his most sensational designs are the Maserati Mistral models and the first generation Quattroporte, the AC 428 fastback coupé and the Spider, as well as the Renault Floride. After BMW took over Glas, Frua wanted to maintain business with BMW; however, they were not successful in this.

BMW 1600 GT CONVERTIBLE

Unlike Glas, BMW did not offer a mass-produced convertible version of the 1600 GT. BMW built only two prototypes featuring the same technical and optical modifications as the sports coupé. One of the models was given to BMW's major shareholder, Herbert Quandt; the whereabouts of the other one are unknown. The Quandt family gave the unique specimen back to BMW AG, which gave it to the Center for Technology of the Allianz insurance company at the beginning of the 1980s, in order to have it restored. In 1994, the BMW AG re-acquired the completely-refurbished convertible for its historical collection.

synthetic leather upholstery; there was also the option of a sunroof. The interior equipment was all focused on the driver. Thanks to sporty dashboard instruments, the driver could always keep track of the automobile's condition. In addition to a speedometer, a rev counter and fuel gauge, the dashboard also featured an oil-pressre gauge, a thermometer for oil and cooling water, and several monitoring lights.

The 07/1968 issue of the magazine "auto motor und sport" offered quite a positive summary: it made special note of the spacious bodywork (unusual for a coupé), the functional equipment, the good windshield wipers, the large tank, and the engine's low fuel consumption. What it criticized was the lack of directional stability, the four-speed transmission, and the small opening angle of the doors. The assessment of the rear axle manufactured by BMW read as follows: "Compared to the easily shifting rigid axle, the road adhesion of the rear wheels has been considerably improved, thereby resulting in better curve properties on uneven roads and in better overall driving safety". The final summary given by the motor sports magazine was that for friends of the BMW brand who "wish for a pretty two-seater for everyday use, the spacious, economical, and quite comfortable 1600 GT offers pretty much all they need".

Despite these quite optimistic signs and the prominent advocate the car had in BMW major shareholder, Herbert Quandt, BMW took the sports coupé off the market in August 1968, after only one year of production and 1,256 units sold. One year later, BMW discontinued the production of all Glas automobiles. The BMW 1600 GT had been a good car, but apparently not good enough to satisfy the standards of the BMW brand. Besides, many buyers were sceptical towards mixing two technologies and brands, and preferred to go for thoroughbred BMW cars. Today, the rare BMW 1600 GT ranks among sought-after classics. In very good condition, it is worth up to 25,000 Euro.

THE CATHEDRALS OF MODERN TIMES

In the spring of 2010, the BMW Museum will host the travelling exhibition "Museums in the 21st Century. Ideas Projects Buildings" – a spectacular exhibition of contemporary museum models designed by the best-known contemporary architects.

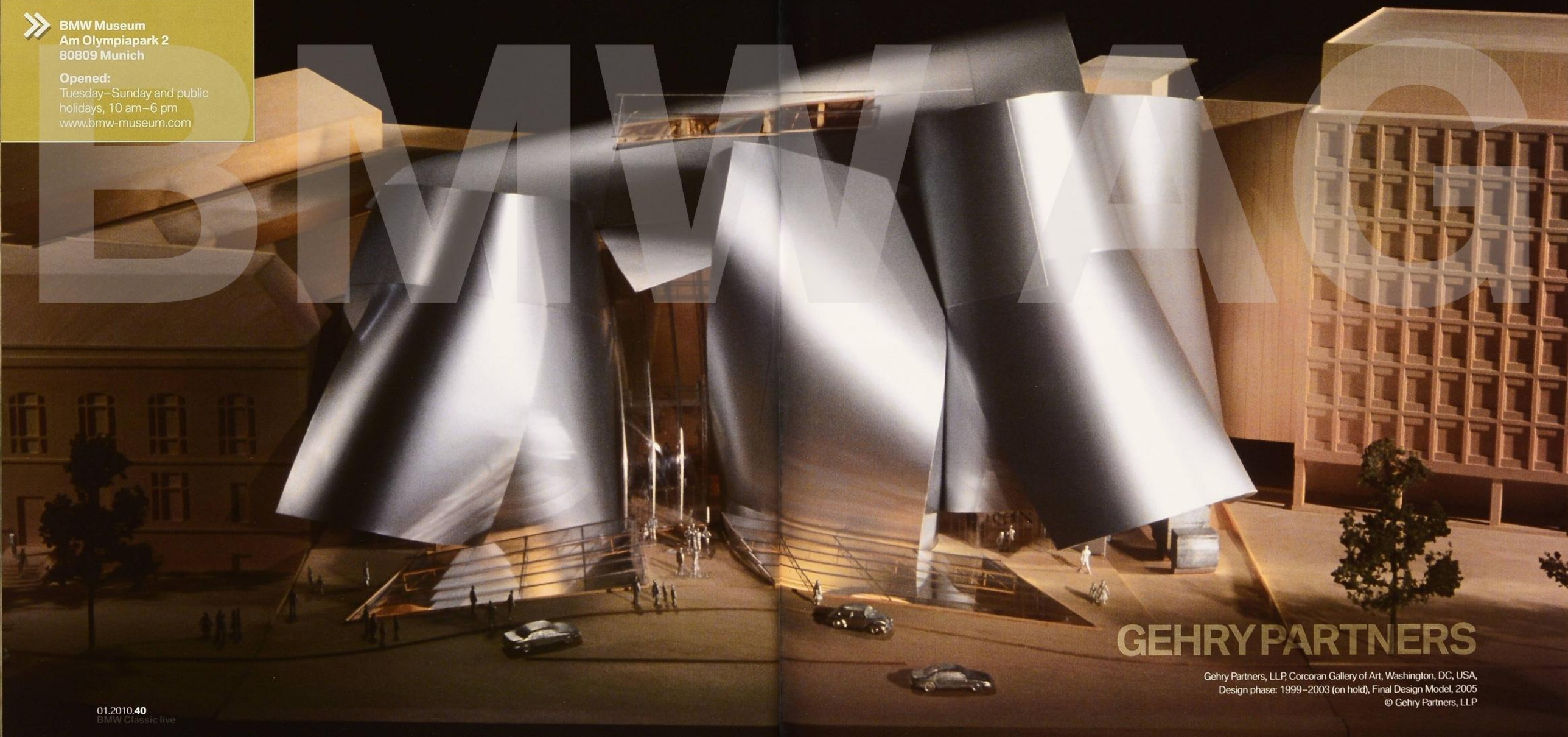
By Dr. Andreas Braun

BMW Museum
Am Olympiapark 2
80809 Munich

Opened:
Tuesday–Sunday and public holidays, 10 am–6 pm
www.bmw-museum.com

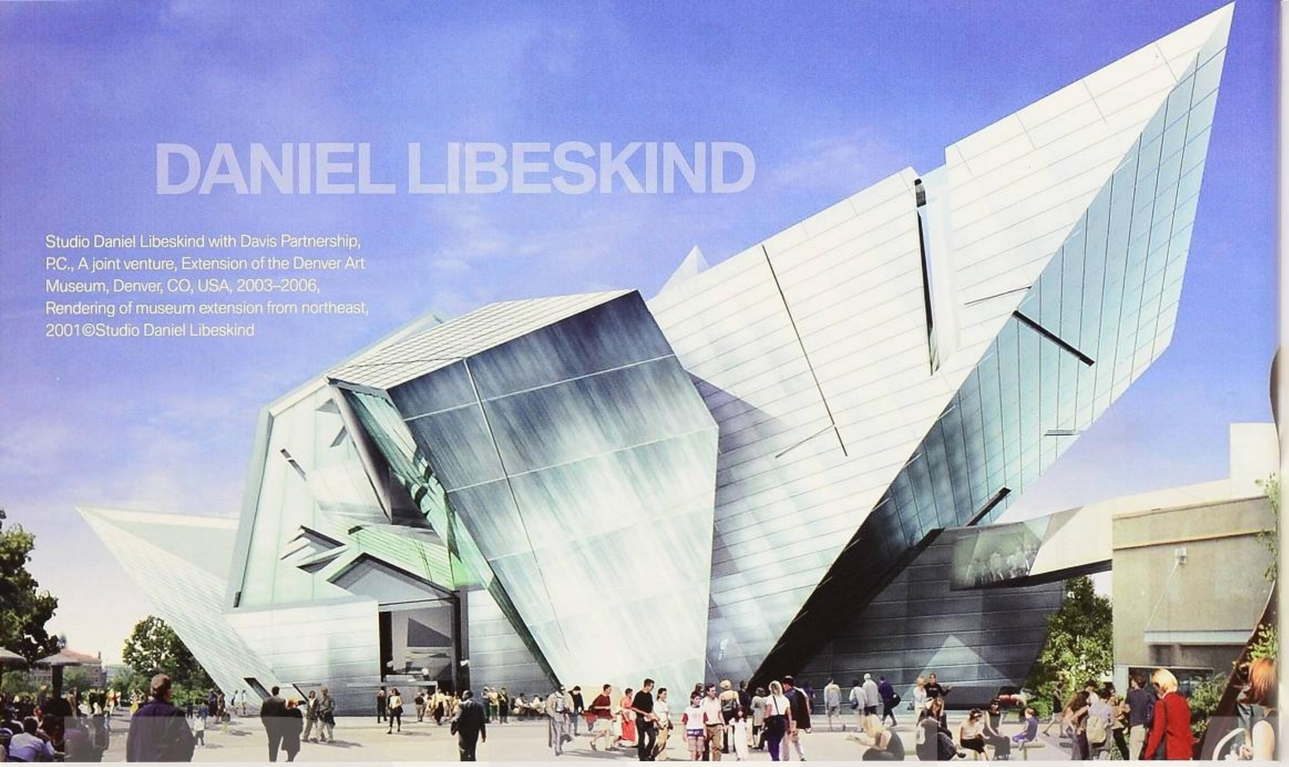
A modern glass cube boldly stands out from a sea of faceless skyscrapers. Only a few steps away, a moulded monster barges roughly in between two venerable museum buildings – a complete contrast to the planned visitor centre, which almost sinks into the ground next to an iconic landmark.

These modern architectural structures all have one thing in common: they could hardly be more different from each other. Spectacular and ambitious, unconventional or adaptable, in harmony with their surroundings or deliberately standing out from them, resembling a spaceship right after landing or conveying the pathos of a seemingly endless adventure park. Today's museum buildings no longer have anything in common with their predecessors built in the 19th century. The times are over when classical temple facades with sturdy colossal columns gave museums the serious character of a teaching institution, mainly visited by ambitious middle-class intellectuals brave enough to enter. Conventional museum exhibitions of dusty relics are history. Modern museums function as adventure centres, attracting visitors by appealing exhibitions and by using modern media installations as crowd magnets. As "soft location factors", they contribute to the glamour of major cities, turning them into cultural hotspots. They are seismographs of the prosperity and cultural values of society, often shaping urban landscapes as "cathedrals of modern times".



Gehry Partners, LLP, Corcoran Gallery of Art, Washington, DC, USA,
Design phase: 1999–2003 (on hold), Final Design Model, 2005
© Gehry Partners, LLP

DANIEL LIBESKIND



Studio Daniel Libeskind with Davis Partnership, P.C., A joint venture, Extension of the Denver Art Museum, Denver, CO, USA, 2003–2006, Rendering of museum extension from northeast, 2001©Studio Daniel Libeskind

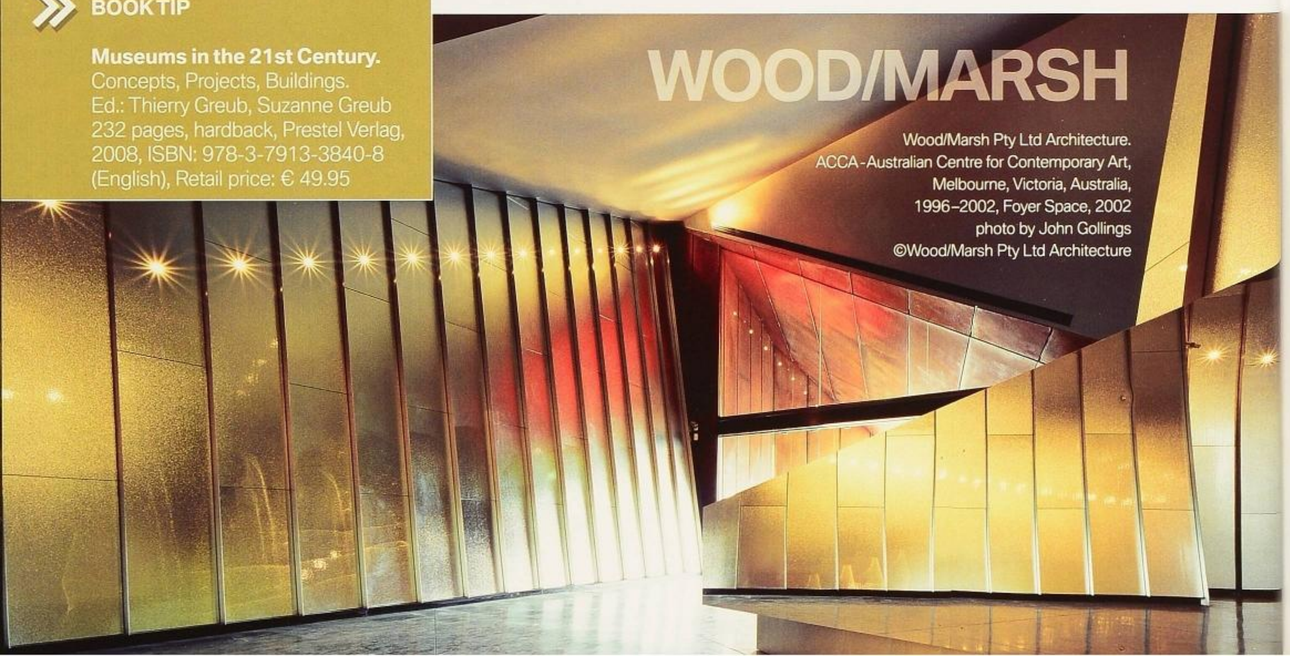
The exhibition "Museums in the 21st Century. Ideas Projects Buildings" impressively portrays the abundant possibilities of museum design in the 21st century. In 2005 and 2006 Suzanne and Thierry Greub, founders of the Basel Art Centre, put together a compilation of the most interesting and promising museum projects and invited the architects to provide the public exhibition with their first ideas and outlines, as well as specific plans, models, and pictures. The result is a fascinating insight into contemporary processes of creation and self-conceptions of museums worldwide. The list of the participants reads like a who's who of the world's best architectural offices, including outstanding designers such as Tadao Ando, Zaha Hadid, Mario Botta, Renzo Piano, Jean Nouvel, and Daniel Libeskind, as well as Coop Himmelb(l)au, and Frank O. Gehry. The last-named has contributed considerably to the museum boom of the 21st century. His design of the Guggenheim Museum in Bilbao in the north of Spain has brought new life to an entire region and inspired at least one generation of architects to design spectacular new buildings.

The exhibition comprises 27 projects, which were realized in the first decade of the 21st century, are still emerging, or aim to be a source of inspiration with their timeless ideas. You encounter them in America, Europe, Asia, and Australia, in the form of exhibition houses for contemporary art, history, or ancient excavations. The Mercedes Benz Museum in Stuttgart and the BMW Museum in Munich add to the exhibition two brand museums of the most important automobile manufacturers.

BOOK TIP

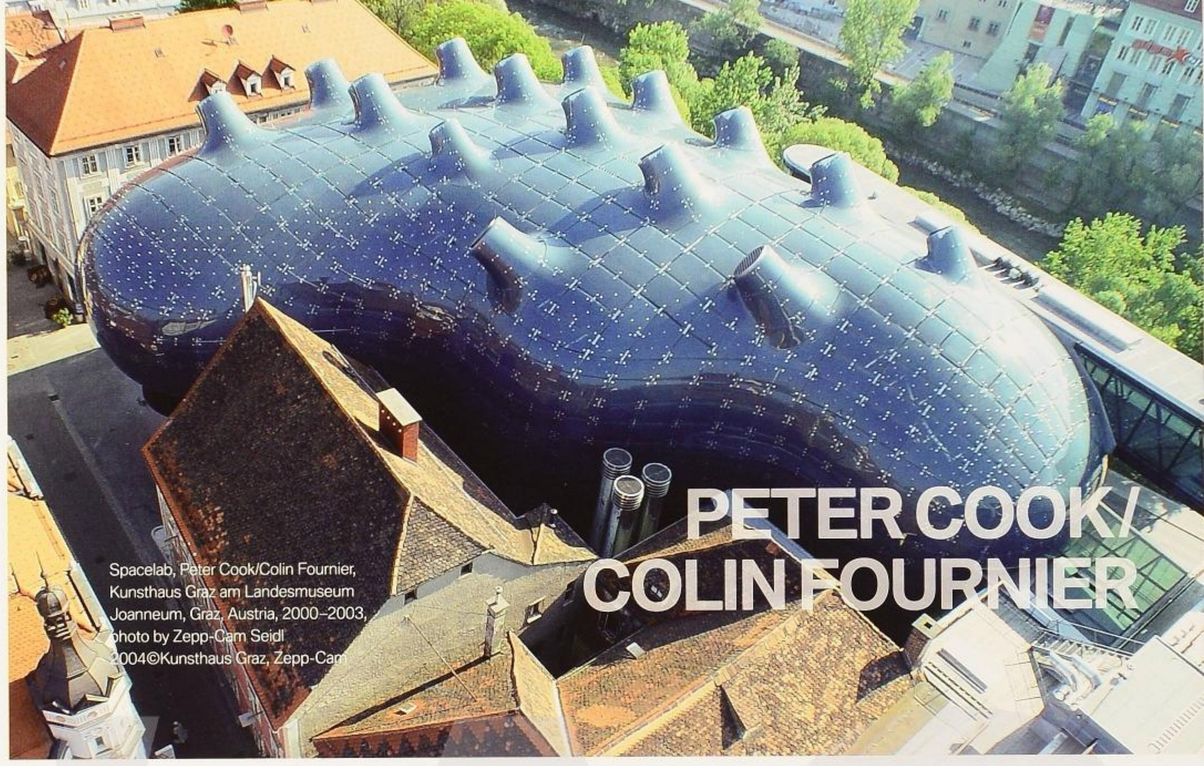
Museums in the 21st Century.
Concepts, Projects, Buildings.
Ed.: Thierry Greub, Suzanne Greub
232 pages, hardback, Prestel Verlag, 2008, ISBN: 978-3-7913-3840-8 (English), Retail price: € 49.95

WOOD/MARSH



Wood/Marsh Pty Ltd Architecture. ACCA-Australian Centre for Contemporary Art, Melbourne, Victoria, Australia, 1996–2002, Foyer Space, 2002 photo by John Gollings ©Wood/Marsh Pty Ltd Architecture

PETER COOK/ COLIN FOURNIER

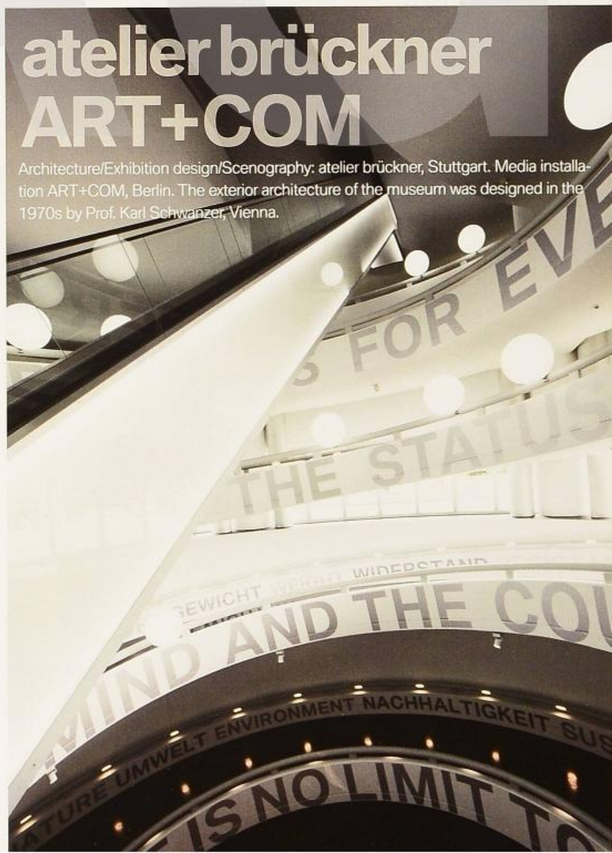


Spacelab, Peter Cook/Colin Fournier, Kunsthaus Graz am Landesmuseum Joanneum, Graz, Austria, 2000–2003, photo by Zepp-Cam Seidl 2004©Kunsthaus Graz, Zepp-Cam

The BMW Museum – created by BMW AG in co-operation with Atelier Brückner, ART+COM, and Integral Ruedi Baur – is regarded as an innovative example of cautiously setting up a modern version of a museum in an existing building. Unlike BMW Welt (the delivery centre for new BMW models designed by Coop Himmelb(l)au), the BMW Museum across the street, together with the BMW Tower accommodating BMW's headquarters, forms part of a heritage-protected architectural landscape. In contrast to that, the inside of the museum features cutting-edge scenography, which presents more than 90 years of BMW's brand and product history in an aesthetic and eventful manner, embedded in a unique multimedia landscape. The numerous prizes and awards the BMW Museum has received since the opening in June 2008, as well as its participation in this travelling exhibition, give evidence of the great success the museum has become.

The exhibition had its debut in the summer of 2006 in Düsseldorf. Afterwards, it went on a world tour, which takes it to some 20 cities. Until now it has been to inter alia Rome, Linz, Lyon, Lisbon, Berlin, and several cities in the USA. From 20 May to 19 September 2010 it will be exhibited in the bowl of the BMW Museum, replacing the present temporary exhibition of BMW concept vehicles. The 27 architectural models, including pictures and blueprints, will be showcased in an exhibition space of about 1,000 sqm on 5 platforms. The complete show looks at how modern museums blend into the structure of a city or a landscape, how they master the challenge of "only" extending already existing buildings, and how they need to be designed to stand out as "architectural diamonds". The exhibition particularly impresses with the rich variety of different projects and, for the most part, very elaborate architectural models. It not only addresses architects and designers, but was purposely conceived to appeal to a large public.

atelier brückner ART+COM



Architecture/Exhibition design/Scenography: atelier brückner, Stuttgart. Media installation ART+COM, Berlin. The exterior architecture of the museum was designed in the 1970s by Prof. Karl Schwanzer, Vienna.

BMW GROOVES IN 5/4 TIME

Since the 1990s, "sound branding" – short sound sequences or melodies – has been an integral part of audio-visual brand communication. BMW started very early to integrate this distinctive characteristic in its advertising campaigns, treading its own music path in the 1960s and 1970s.

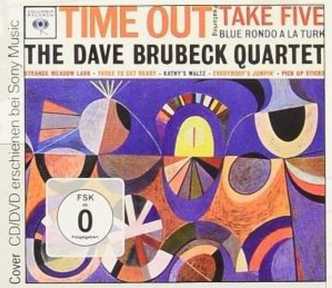
By Dr Florian Triebel Photos BMW AG

After the company's profound crisis in the 1950s, a wind of change blew into the Bavarian Motor Works. Dr Herbert Quandt's encouraging confidence in the company's inner strength brought about a new beginning in many areas. All parties involved put their hearts and souls into making the company's new start a success.

This also included a new advertising format. In the 1950s, advertising films were still rather rare. BMW had produced only very few, such as ones for the BMW Isetta and the BMW 700. In the 1960s, this marketing technique became much more widespread, to include short films for cinemas and also the relatively new medium of television. From 1962, BMW automobiles were promoted by advertising film, at this point still in black and white; the BMW LS and the cars of the "New Class" were the first to be promoted in this manner.

In some cases, these moving pictures were accompanied by sound. A voice, usually male and very distinctive, pointed out the features and advantages of the promoted product. As background music, BMW chose dynamic, jazzy compositions, which reflected the spirit of the time and drew attention to the sporty, sophisticated brand image BMW wished to regain.

Starting from 1966, all BMW commercials featured the same jazz melody: Dave Brubeck's "Take Five", a composition that had taken the international music scene by storm seven years earlier. Now the background music for all BMW commercials, the jazz classic soon turned into the brand's new signature tune. From 1966 it was heard every time a BMW commercial appeared on cinema or TV screens, promoting the models of the "New Class", and from 1967 the recently launched automobiles of the 02 Series. The 30-second short films always featured a powerful combination of visual impressions, message, and melody; at the end of the short version of Take Five, which had been specially recorded for the BMW commercials, three distinctive chords resounded as the speaker emphasized the letters B, M, and W, which together formed a distinctive final cadence.



Cover CD/DVD erschienen bei Sony Music

TAKE FIVE

In 1959 the Dave Brubeck Quartet, consisting of Dave Brubeck at the piano, Paul Desmond on the saxophone, Joe Morello on the drums, and Eugene Wright on the upright bass, recorded the album "Time Out". The jazz compositions of the album were characterized by catchy tunes and unusual rhythms. "Blue Rondo à La Turk" was, for example, composed in an unconventional 9/8 time in the style of the Turkish folk dance Zeybek.

Take Five was in 5/4 time, which is also unusual for jazz music. Brubeck came up with this idea when Morello was warming up in 5/4 time before a concert and Desmond started to jam along. The trio kept experimenting and eventually combined their musical ideas into Take Five. Desmond, who was officially responsible for the composition, transferred the royalties to the American Red Cross in 1977.

Shortly after Time Out was published, Take Five turned out to be an unexpected and extraordinary success. The single was the first jazz title to make it into the top 100 of the US Billboard Charts, and soon became a jazz standard that inspired a number of artists to create their own adaptations. The composition owed a great deal of its popularity to its appearance in a variety of movies and television series, as well as in BMW advertisements.

THE DAVE BRUBECK QUARTET (1960)

© Sony Music

The public soon clearly associated Take Five with BMW; the powerful rhythm and catchy melody perfectly matched the brand's character. BMW used it in their advertising films until the middle of the 1970s, for the last time in a commercial spot promoting the BMW 1502 and broadcast from 1975 to 1977. The jazz standard then disappeared from the BMW ads after having contributed to the distinctive brand image for almost 10 years. From that point on, the brand pursued a new musical path.

BMW commercials from the years 1965 to 1975 featuring the jazz classic Take Five can be watched at bmw-classic.de/take5.

SOUND-BRANDING AT BMW

Presentations of the BMW brand are associated with two forms of music: the brand-specific music played at dealerships and events, and an acoustic logo used in audio-visual advertising. The current acoustic logo – a two-tone motif with a technological effect – primarily serves to accentuate the visual advertising content and to emphasize the slogan Sheer Driving Pleasure as it fades in. The sound logo is also used in radio spots. The turn was introduced in the 1990s and is now unequivocally associated with the brand. It was developed by BMW's lead agency at the time, Jung von Matt, and the agency Interbrand Zintzmeyer & Lux, which was responsible for BMW's Corporate Identity for decades.

90 YEARS OF THE BMW BOXER

A SOUGHT-AFTER ENGINE BUILDER

The Bayerische Motoren Werke launched its first motorcycle model in the autumn of 1923. This was not, however, the company's debut in the two-wheeler market: as early as 1920, BMW had started to manufacture the first boxer engines, which it supplied to numerous motorcycle manufacturers.

By Fred Jakobs Photos BMW AG

MARTIN STOLLE

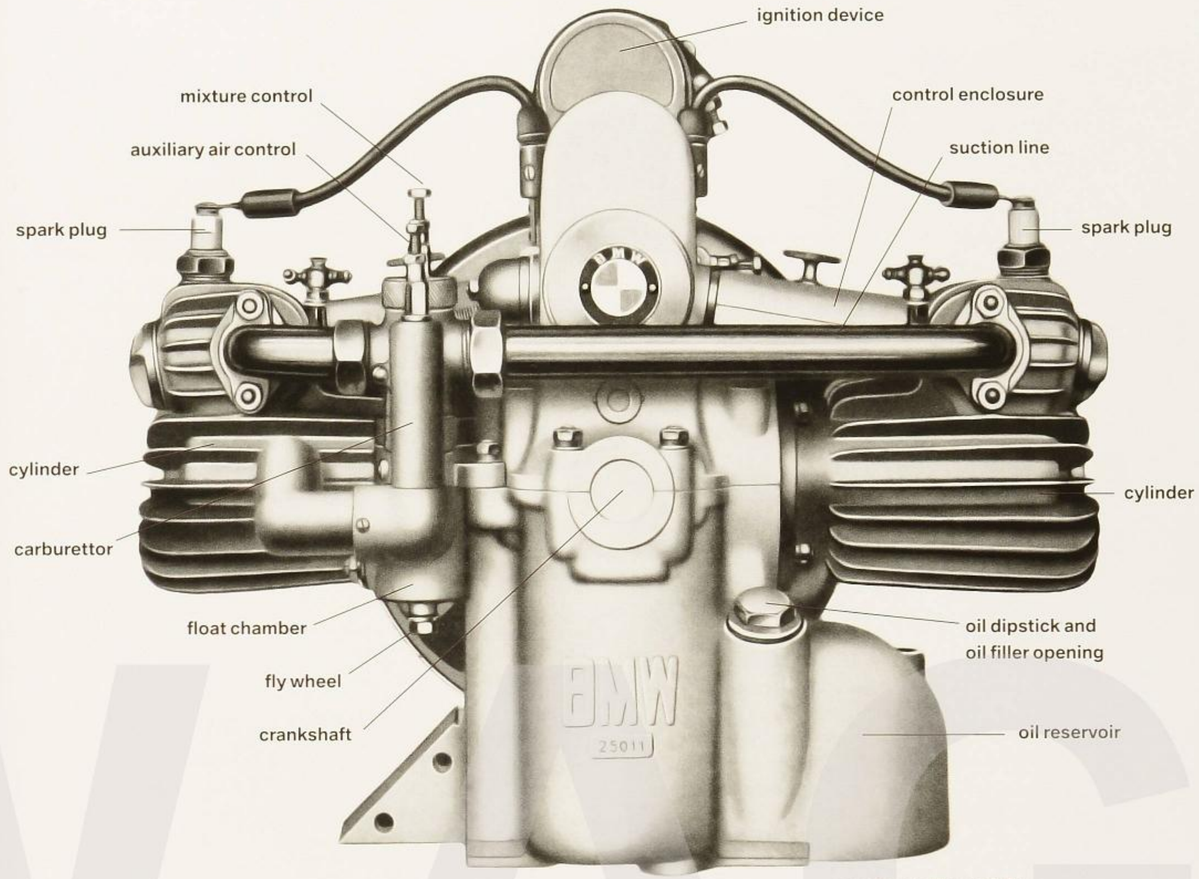
Martin Stolle, born in 1886 in Berlin, was a talented technician and an enthusiastic motorcycle aficionado. Having already worked in an engineering works as a teenager, he soon started to develop engines of his own, using light metal pistons. In 1909 he bought his first motorcycle, and before the outbreak of World War I, he already owned an English Douglas as well as a Belgian FN. At the beginning of the war, he was stationed in a motorized unit; he was later transferred to the air force. In 1917, he was released to work for the Rapp Motorenwerke. The Rapp Motorenwerke turned into the Bayerische Motoren Werke (Bavarian Motor Works), and Stolle became a member of the company with its true blue-and-white Bavarian coulours.
After he left BMW in 1922, he continued to work in the automotive industry and was involved in different constructions such as the "D-Rad" made by Deutsche Industriewerke and the KR 9 made by Victoria. He later worked as a motor vehicle assessor. Stolle died in 1982.

In World War I, the Bayerische Motoren Werke earned a great reputation in a very short time thanks to its aircraft engine, the BMW IIIa. In 1919, a BMW IV engine took Zeno Diemer up to a height of 9,760 metres, earning him the World Altitude Record. This record impressively demonstrated the productivity and the expertise of BMW's engine designers. When the Treaty of Versailles banned Germany from manufacturing aircraft engines, it abruptly stopped the Bavarians from flying high.

The company, disposing both of well-trained employees and modern machinery, now had to find a new business domain. Of course, it stood to reason to keep doing what it knew best: constructing engines. Consequently, it started to manufacture large four-cylinder in-line engines with a displacement of about eight litres and an output of about 60 hp, developed for use in trucks, tractors, and boats. However, the sales volume failed to live up to expectations.

It was a young development engineer named Martin Stolle who put the company on the right track. His suggestion to build motorcycle engines sparked management's interest. Stolle's role model for developing the first BMW motorcycle engine was the engine of his English Douglas motorcycle. Thanks to many years of driving experience, he recognized the decisive advantage of this power unit – its unrivalled running smoothness. Under the designation number "M 2 B 15", BMW developed a side-valve boxer engine with 494 cc displacement, which

← LEFT A BMW brochure from 1921. Whereas the big four-cylinder engine stands for work and transportation, the "Bavaria small engine" promises sheer riding pleasure.



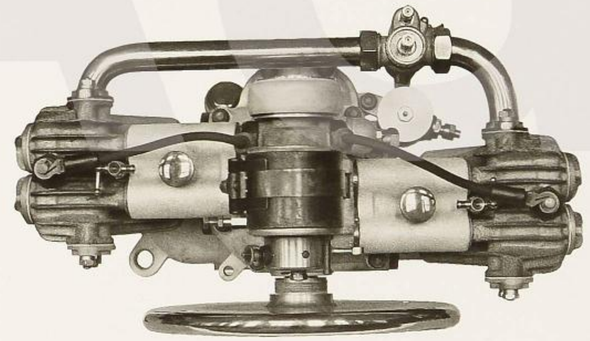
↗ ABOVE The clear and compact design of the BMW M 2 B 15.

carburettor side

featured a square design with bore and stroke of 68 mm each, and produced 6.5 hp at 4,500 rpm. This rather conservative engine design promised a high reliability. Under the sales designation "Bavarian small engine", the BMW M 2 B 15 was offered to different motorcycle manufacturers at the beginning of the 1920s.

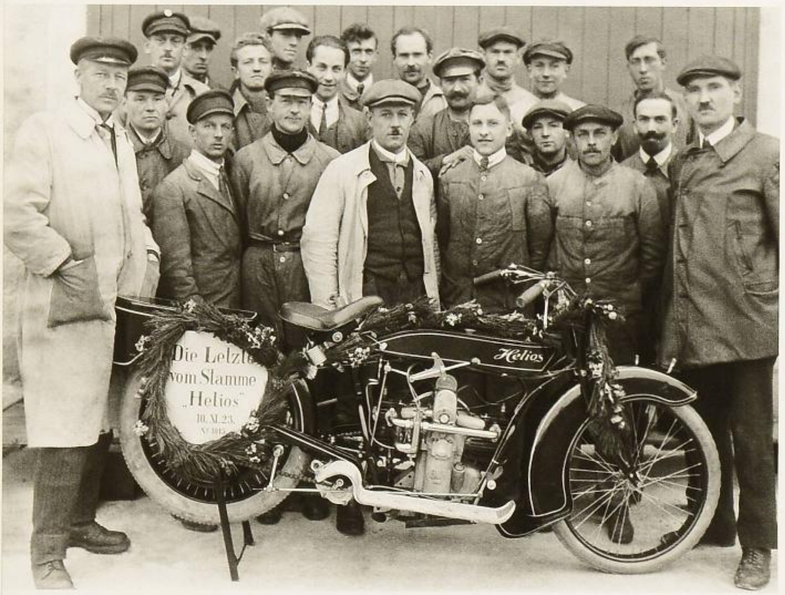
As a consequence of World War I, motorization, including that of motorcycles, was delayed in Germany in comparison to that of its neighbouring European countries. At the beginning of the 1920s, most German motorcycle manufacturers were companies – so called "assemblers" – that only manufactured some parts themselves and purchased other components, even important ones such as engines and transmissions, from external suppliers. Altogether, there were more than 130 motorcycle manufacturers in Germany in the 1920s. The desire for mobility was growing so fast that the number of registered motorcycles in Germany increased almost fivefold from 1920 to 1924.

Consequently, there existed a high demand for motorcycle engines. The biggest buyer of the BMW boxer engines was the Victoria Company in Nuremberg, which was the centre of the German motorcycle industry at that time. The Victoria Werke, originally a successful bicycle manufacturer, had presented a motorcycle prototype as early as in 1901, and was a pioneer in



↑ ABOVE A view from above shows the offset cylinder design typical of boxer engines.

the motorcycle industry. Until 1910, they had been manufacturing relatively small quantities of several models, in which they used engines made by, among others, Cudell, Fafnir, and FN. After a production break of ten years, in 1920 they launched the motorcycle model KR 1, the heart of which was the "Bavarian small engine" made by BMW. The KR 1 was regarded as one of the most modern German motorcycles and, despite fierce competition, attracted many buyers. The Bayerische Motoren Werke benefited from Victoria's success as well: more than 1,000 of their engines were fitted in the KR 1 alone. The BMW M 2 B 15 exceeded all expectations by far.



↗ ABOVE Franz Bieber, the first German champion on a BMW motorcycle in 1924, at the Ruselberg Race in 1922 with his Victoria fitted with a BMW engine.

↖ LEFT In November 1923, proud employees present the last Helios to be manufactured.

Aside from Victoria, there were a number of other brands using the BMW boxer engine as a drive unit; most of their names have been forgotten today. Next to the Bison Werke near Vienna and the Corona Werke near Berlin, it was primarily manufacturers in and around Munich who employed the BMW engine: the Stockdorfer Motorenwerke (SMW), Karl Rühmer's company KR, which even offered an improved version of the engine delivering a performance of up to 14 hp, or the Bayrische Flugzeugwerke (Bavarian Airplane Works), which built the M 2 B 15 into their "Helios" model. Unlike the Victoria models, these models did not, however, manage to assert themselves on the market and were only produced in small volumes.

The M 2 B 15 not only was used in motorcycles but also served as a stationary engine for driving different machines. The aviation pioneer Friedrich Budig even built it into a light airplane, which he used for short flights in 1924.

Nevertheless, BMW's interlude as a supplier for other motorcycle manufacturers did not last long. The smaller manufacturers soon disappeared from the market again, and Victoria recognized the benefits of developing their own engines. To do so, they poached Martin Stolle from BMW.

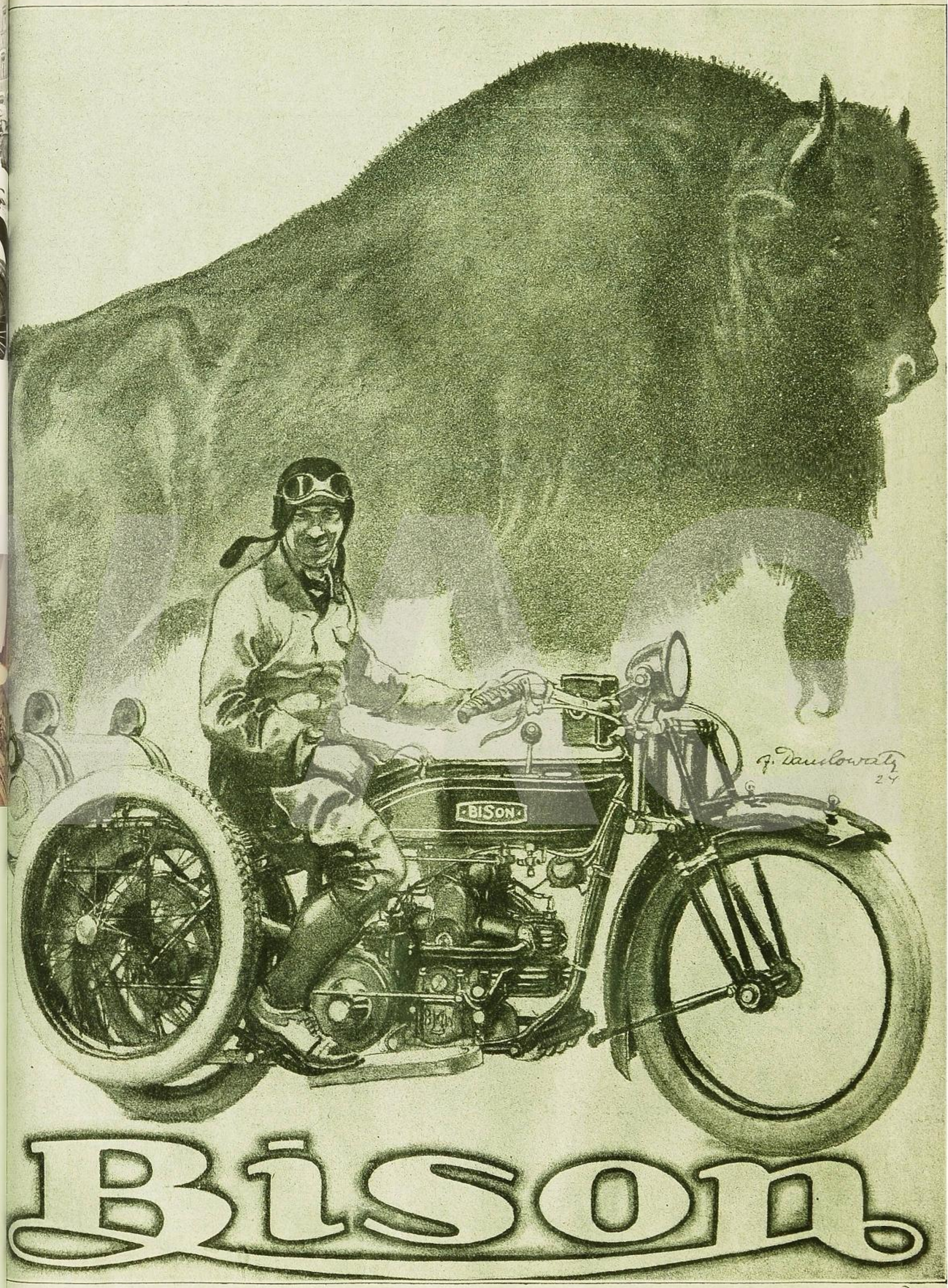
By losing Victoria, BMW had lost its most important customer, and it was unlikely that the other customers would be able to compensate for this loss. Besides that, BMW had virtually taken over one of the small-scale manufacturers: the Bayrische Flugzeugwerke (BFW) with their "Helios" model. Since numerous units of this model were still in stock and had not been sold, BMW had the undercarriages modified to improve their road performance. But this was only a temporary solution. Aware of this, BMW Design Director Max Friz started to design a completely new motorcycle. Its debut at the Berlin Auto Show in September 1923 under the name of BMW R 32 also signalled the end of the first BMW boxer engine, the "Bavarian small engine".

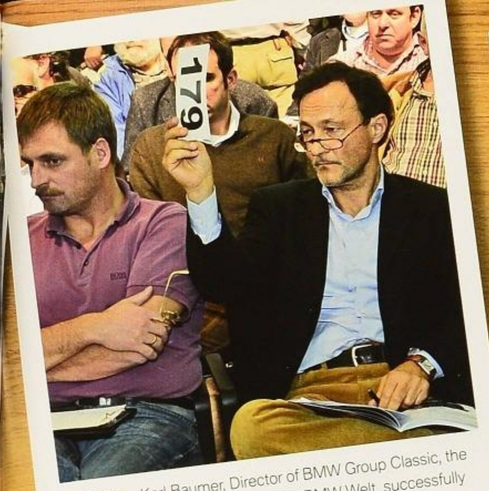
THE VORCHDORF MOTORCYCLE MUSEUM

Today, motorcycles from external manufacturers equipped with the first BMW boxer engine are much-sought-after collector's items. Since the Victoria KR 1 model was produced in larger quantities, there are still several of them today – one of them is part of BMW Group Classic's historical collection. There are, however, only one or two known units left of each of the other brands.

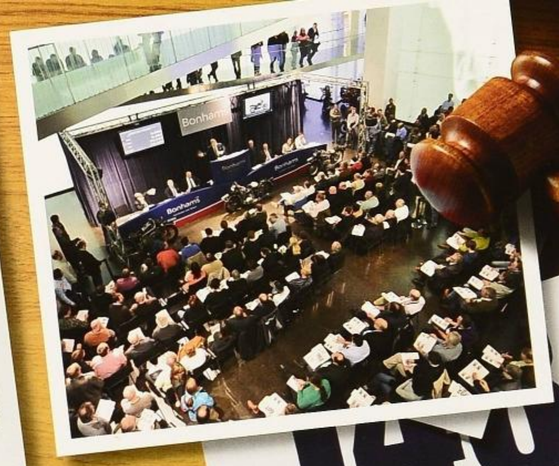
The "ancestors" of all BMW motorcycles can be admired in Vorchdorf motorcycle museum in the Austrian region of Salzkammergut, which even hosts three of these rare models: a Victoria KR 1, a Bison, and a Helios. BMW motorcycle fans are treated to much more though: the collector Franz Ammering has collected almost 100 vehicles of the white-and-blue brand, among them the only cutaway model of the BMW R 32 as well as a sports version of the rare BMW R 63.

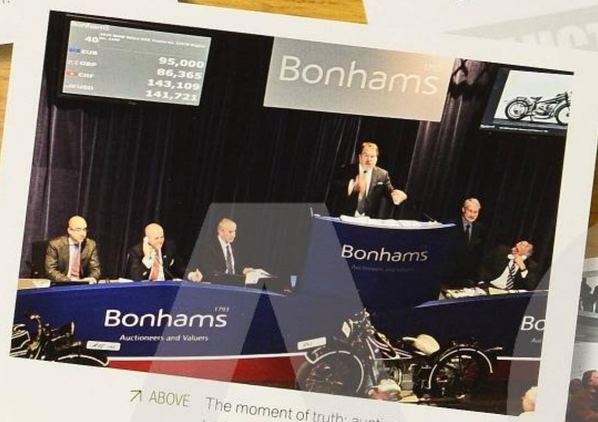
For more information please go to www.motorradmuseum-vorchdorf.at.





↗ ABOVE Karl Baumer, Director of BMW Group Classic, the BMW Museum and the BMW Welt, successfully bid on the BMW R 67/2 ISDT.





↗ ABOVE The moment of truth: auctioneer Malcom Barber letting the hammer fall for the BMW R 32.

↖ ABOVE The BMW R 32 from Willy Neutkens' collection changed hands for the record amount of 109,250 Euro.

AUCTION BATTLE FOR A BMW MOTORCYCLE.

By Fred Jakobs Photos Bernhard Limberger

On 28 November 2009, the collection of the late motorcycle aficionado Willy Neutkens was put up for auction at the BMW Museum. The event, conducted by the renowned British auction house Bonhams, exceeded all expectations: the auction was attended by more than 1,000 visitors, amongst them 320 registered bidders; and all of the 94 lots were sold, bringing in 1,038,400 Euro (including commission), much more than the 700,000 Euro that experts had estimated. The absolute highlight of the auction was one model of the very first BMW motorcycle, a BMW R 32 from 1924, which unleashed a five-way bidding battle spanning three continents. Eventually, an Australian businessman gained the upper hand and snatched the motorcycle for a hammer price of 95,000 Euro. Including the buyer's premium, the final selling price totalled 109,250 Euro – the highest amount ever paid for a BMW production model. "That's a lot of money, but I consider this purchase a long-term investment. On top of this, it will be the first BMW R 32 on the Australian continent," the collector explained. Before getting his newly acquired treasure ready for shipment, he had it serviced at the BMW Classic Center.

In the wake of the R 32, other BMW motorcycles also received high bids. In particular, the pre-war models brought in much more than experts had estimated. An Italian who had been outbid on the R 32 was willing to pay 68,000 Euro for a BMW R 63 from 1929. The most renowned BMW motorcycle collectors from the US and Europe were in the audience, and Japanese bidders participated via the telephone.

But the auction offered much more than just rarities. The special flair of this Saturday afternoon owed much more to the fact that a model suited to almost every taste and budget came under the hammer. Even entry-level models attracted numerous enthusiasts, including many BMW employees. The new owner of a BMW R 45 from 1978 left the auction almost as proud as the Australian businessman. After all, the R 45 had been his very first motorcycle and for this memory of his youth he was willing to pay 1,600 Euro.

BMW itself was not simply hosting this memorable event: Karl Baumer, Director BMW Group Classic, BMW Museum, and BMW Welt, bought a BMW R 67/2 Cross Country for BMW's historical collection. This motorcycle lined up at the International Six Day Trial in 1953, ridden by the BMW works team, consisting of Georg Meier, Walter Zeller, and Hans Roth. "By adding this milestone in motorcycle history to our collection, we have definitely filled a gap. Since this purchase perfectly matches both BMW Motorcycle's current engagement in cross-country sports and the upcoming 30th anniversary of the GS model line, we will soon present the vehicle at several events, as well as here in the museum", Baumer explained.

Both the visitors and the organizers of the auction gave positive feedback. Malcolm Barber, CEO of Bonhams and an entertaining auctioneer at the auction, said: "We have been working very closely with the BMW Museum and the BMW Group Archives. This has guaranteed good advertising, an informative catalogue, and the smooth running of the auction – all of which contributed to this excellent result."
The prices achieved are also evidence of the strength of the BMW-brand motorcycle. While automobiles such as the BMW 328 or the BMW 507 have been playing in the first division for a long time, the two-wheelers have often been overshadowed. With this auction and the record bid for the BMW R 32, BMW motorcycles have also established themselves in the top group.

BMW WINS AT THE MILLE MIGLIA IN 1940

AN ETERNITY AHEAD OF THE COMPETITION

Reaching an average speed of more than 166 km/h at the 1,500 kilometre race in 1940 was an outstanding performance. Considering that even today with a modern car this would be a challenge, the race drivers who accomplished this behind the wheel of a race car 70 years ago deserve nothing but respect.

Text Niklas Drechsler Fotos BMW AG

BMW 328 TOURING COUPÉ

Fritz Huschke von Hanstein and Walter Bäumer celebrated victory behind the wheel of the Coupé with the number 70.

BMW 328 MILLE MIGLIA ROADSTER SERIES I

Hans Wencher and Rudolf Scholz achieved the sixth place with the so-called "Trouser Crease" roadster (because of the distinctive line in its fenders).

BMW 328 MILLE MIGLIA ROADSTER SERIES II

The two structurally identical roadsters of the Series II with the race numbers 72 and 74 came in third and fifth after 1,000 miles. The drivers were Adolf Brudes/Ralph Roese and Willi Briem/Uli Richter.

BMW 328 „KAMM"-RACING SALOON

The racing saloon with the number 73 dropped out due to a technical defect in its oil circulation. The drivers were Giovanni Lurani Cernuschi and Franco Cortese.

BMW triumphed even with the company's very first automobile: a BMW 3/15 PS DA 2 Convertible won the International Alpine Rally in 1929. It was only the first of a series of victories achieved throughout Europe, and marked the beginning of the sporty image of the BMW brand. Whether at the Kesselberg Race in the Bavarian foothills of the Alps, at the Grand Prix in Kronstadt, Romania, at Germany's Großer Bergpreis, or at the Belgrade City Race – BMW race cars usually dominated their class, achieved overall victories, and repeatedly posted excellent times.

At the International Eifel Race at the Nürburgring in 1936, the BMW 328 – still in the preproduction stage – both gained the class victory and sported the fastest lap, prevailing over considerably stronger competitors. From that point on, slightly modified BMW 328 production vehicles dominated the 2-litre class. In 1939, the BMW 328 Touring Coupé, featuring a specifically designed streamlined body, celebrated the class victory at the 24 Hours of Le Mans Race. However, one triumph outshone all of these successes: the overall victory at the Mille Miglia in 1940. Before 1945, this was the most important car racing victory BMW ever achieved. The fact that BMW also pocketed the prize for endurance, as well as the team prize for victory in all classes, added to this achievement. From today's point of view, there is hardly anything comparable to this victory. It was only after World War II that the 24 Hours of Le Mans became of similar importance.

The 1940 Mille Miglia saw five special BMW 328 variants lining up: a coupé, a racing saloon and three roadsters. All of them had specifically designed streamlined bodies, tubular space frames, an outer skin made of aluminium, and BMW 328 engines boasting about 135 hp (instead of the 80 hp produced by the production models). What

← FAR LEFT The last preparations before the start of the 1940 Mille Miglia.

← LEFT The drivers Ralph Roese, Rudolf Scholz, Adolf Brudes und Willi Briem (from left to right) waiting to line up.

→ RIGHT The BMW 328 Roadster on ist way to to the Mille Miglia. All racing vehicles got to Italy on their own four wheels.

these vehicles all had in common was that most of the work on them had been done at the Munich plant. The roadsters of the second series got only their outer skin at the coachbuilder Touring in Italy; the coupé's bodywork was completely built up by Touring. The remarkable thing about most of the work being carried out at the Munich plant is that before 1945, all BMW production automobiles were built at the Eisenach plant; at that time the Munich plant only produced motorcycles and aircraft engines.

The participation of the BMW cars at the Mille Miglia in 1940 was planned with military precision. As little as possible was to be left to chance. As early as March, BMW started to inspect the new circuit and to train with the race cars. BMW Race Director Ernst Loof, who was responsible for the racing strategy, even looked for suitable depots for supplying the vehicles with petrol and oil. The tyre supplier, Continental, sent an experienced expert to Italy to assist with the preparations. The BMW group did not want to leave anything to chance.

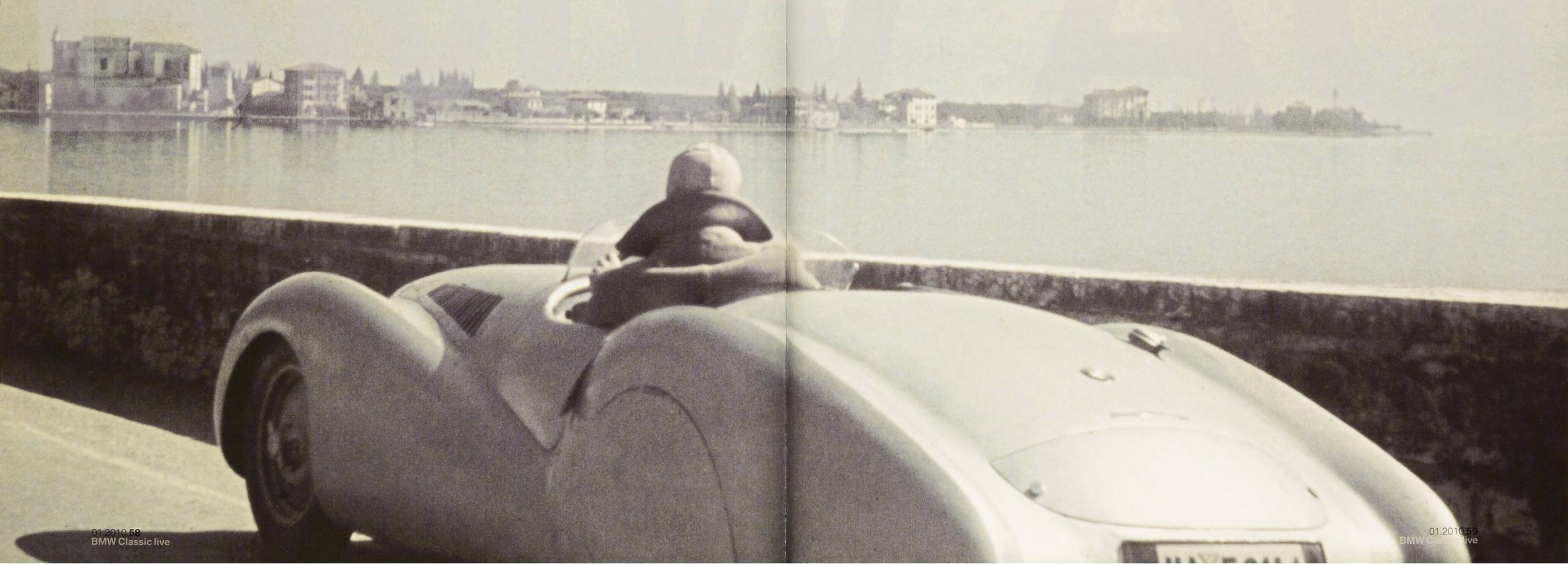
At that stage it was already determined who would field which vehicles. The ONS (Germany's Supreme National Sports Authority) registered the two closed vehicles, and the NSKK (National Socialist Motor Corps) the three open ones, assuming that victories in motor sports were going to contribute to demonstrating Germany's superiority.

The event was definitely not for late-sleepers: the starting signal was given on 28 April at 4 am. The vehicles then started at one-minute intervals. After the first lap, the Hanstein/Bäumer duo at the wheel of the BMW 328 Touring Coupé had already gained a lead of one and a half minutes ahead of the car in second place, which was from Delage. The BMW 328 „Kamm" racing saloon started and finished third. The three BMW roadsters, mainly focussing on the goal of finishing the race without dropping out, thus ensuring a team victory, were in places seven to nine.

Fritz Huschke von Hanstein practically drove himself into a frenzy. He pounded one sensational lap after another in the Italian Po Valley. In his fastest lap, he reached an average speed of 174 km/h over the 167 kilometres – the fastest lap ever recorded in sports car racing at the time. When the duo crossed the finishing line after exactly 8:54:46 hours, they had accomplished an average speed of 166.7 km/h over the complete distance, something that had never been achieved before, and would never be achieved again at the Mille Miglia. To be fair, it must be pointed out that the one-time circuit in 1940 makes a direct comparison impossible. Nevertheless, Hanstein's average speed was sensational, even more so because he finished with a lead of more than a quarter of an hour over the second-placed Alfa Romeo. In motor sports, a quarter of an hour is an eternity.

SILVER FOR GERMANY

Back then, the colours of the race cars were assigned according to the nations fielding the cars. Germany lined up in white, Italy in red, France in blue, and Great Britain in green. In 1934, Mercedes and Auto Union started to enter silver vehicles, and people soon called them "silver arrows". At the Mille Miglia in 1940, BMW painted its vehicles in silver for the first time. The colour was elegant metallic silver with a silk matt shimmer; the official colour designation was "fish silver". Hence the legend that the paintwork was done with fish scales.



Historic race tracks

Mille Miglia

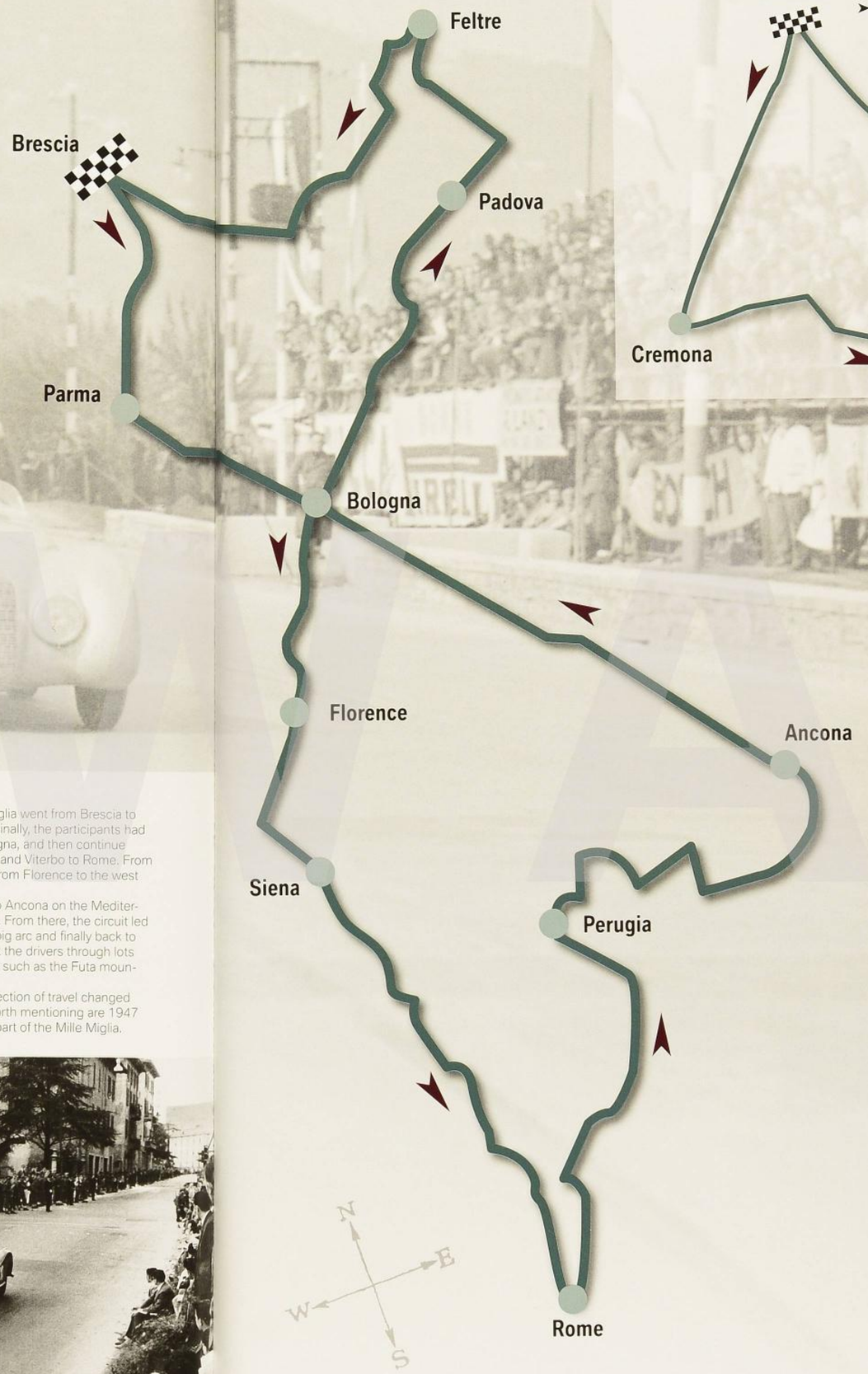
The "Ist Gran Premio Brescia delle Mille Miglia" was a long-distance race, taking its participants over 1,000 miles (about 1,600 kilometers) all across Italy. The event was brought into being in 1927 by the Brescia Automobile Club and was regarded as one of the world's most difficult and longest automobile races at the time. It was held until 1957, with an interruption from 1941 to 1946. Because of fatal accidents, the Italian government also banned the race in 1939 and permanently from 1957 on, until the Mille Miglia Storica was introduced. The first winner was a vehicle from the automobile brand OM. In memory of this triumph, the grid number one has always been, and is still today, assigned to an automobile from OM. Before World War II, Alfa Romeo pocketed most of the victories; after the war, Ferrari sports cars took over, and topped the winners list most of the time.

In 1977 the Mille Miglia was revived as a historic endurance race called Mille Miglia Storica. Today only those vehicle types that participated in the original Mille Miglia are allowed to line up in the revived race.

➤ **Winners**
Italian drivers won the traditional Migle Millia 20 out of 23 times. Only three races were won by foreigners: in 1940, BMW with the duo of Fritz Huschke von Hanstein and Walter Bäumer, in 1931 Mercedes-Benz with Rudolf Caracciola and W. Sebastian, and in 1955 Mercedes with Stirling Moss and Denis Jenkinson. The most successful driver ever was Clemente Biondetti, who won the Mille three times in a row from 1947 to 1949, once in an Alfa Romeo and twice in a Ferrari.

➤ **Speed**
With an average speed of 77.22 km/h, the first race was still comparatively easy-going. In the following years, the speed continuously increased. In 1930 the winners drove for the first time at an average speed of more than 100 km/h. In 1940, BMW pulled off the fastest-ever average time of almost 167 km/h on the one-time circuit. On the traditional course, the Moss/Jenkinson duo achieved the highest average speed of 157.65 km/h in 1955.

➤ **The traditional course**
The traditional course of the Mille Miglia went from Brescia to Rome and back on public roads. Originally, the participants had to go from Brescia via Parma to Bologna, and then continue through Tuscany via Florence, Siena, and Viterbo to Rome. From 1938 to 1950, the route led directly from Florence to the west coast and then via Pisa to Rome.
On their way back, the drivers went to Ancona on the Mediterranean coast and then on to Bologna. From there, the circuit led to Verona via Ferrara and Padua in a big arc and finally back to Brescia. The picturesque course took the drivers through lots of interesting and challenging passes such as the Futa mountain pass.
Later on, both the course and the direction of travel changed many times. Two years particularly worth mentioning are 1947 and 1948, when Piedmont was also part of the Mille Miglia.



➤ **The course in 1940**
In 1940 the course of the Mille Miglia was changed. The participants now had nine laps of a triangular circuit over 167 kilometres linking Brescia, Cremona, and Mantua. The track had been changed because of a fatal accident in 1938.
As a result of this accident, the Mille Miglia did not take place in Italy in 1939 and was only resumed in 1940. A substitute race in 1939 in the Italian colony of Libya attracted little interest.

➤ **BMW at the Mille Miglia**
BMW had its debut at the Mille Miglia in 1938, fielding four BMW 328 Roadsters. The four race cars gained places 1 to 4 in the 2-litre class and won the team prize for endurance. The winners, A.F.P. Fane and Williams, finished the race with an average speed of almost 120 km/h, taking the victory ahead of Prince Schaumburg-Lippe/Count Lurani, Uli Richter /Dr Fritz Werneck, and Count von der Mühle-Eckart/Eckhard Holzschuh.

OPERATION GOLD

BMW Classic is taking the offensive: an armada of BMW 328 models is expected to be successful in the 2010 Mille Miglia Storica. This not only requires driving competence and skills, but above all well-prepared race vehicles.

By Max Bauer Photos BMW AG, Gudrun Muschalla

BMW's racing department is preparing for the Mille Miglia with military precision. Months before the race, BMW Munich and European specialist companies have started to prepare the race vehicles and intensively refine the aerodynamics and engine performance. As early as six months before the event, some of the parties involved have gone to Italy to examine the circuit and organize accommodation. Drivers and vehicles have been sent to train in Italy. Nothing is being left to chance.

The preparations for the Mille Miglia Storica in 2010 are not as comprehensive as those for the Mille Miglia in 1940, when BMW brought home its first overall victory. Nevertheless, all parties involved, especially the BMW Classic Center, are running on adrenaline. "The Mille Miglia is extremely challenging for the vehicles. 1,600 kilometres in three days with the drivers constantly pushing the cars to the limit entails a lot of work for us; not only during the race but also afterwards, and especially beforehand," explains Klaus Kutscher, head of the historical workshop at the BMW Classic Center.

On 6 May 2010, around a dozen vehicles – all BMW 328 models – will line up in Brescia. Of course, they are all supposed to reach the finishing line, one of them as possible in first place – just like 70 years ago. In order to achieve this, several motor mechanics were released from the normal workshop months ago. Experts for pre-war vehicles are now responsible for rendering the fleet fit for racing and capable of winning.

But there is a long way to go. The first step was to bring the BMW 328 cars to Munich: by ship and plane from Australia, China, and Great Britain. Three were borrowed from the BMW Museum, the rest are already in the historical collection in Munich. Aside from the production models, BMW will also field some models featuring special bodywork, among them the winning vehicle from 1940.

Kutscher states that BMW's desire to be successful at the Mille Miglia does not influence the preparations of the race vehicles: "We always prepare the vehicles as well as possible". This means providing maximum performance with the highest possible safety measures for the drivers – whilst taking into account the Mille Miglia's racing regulations.

And the Mille Miglia regulations are causing a lot of work again: seven vehicles need new FIVA passports. The FIVA passport, including the classic's résumé and a certificate of originality, is a prerequisite for participation in the Mille Miglia. In order to obtain this, some of the BMW 328s need to be modified.

3 questions for Dr. Thomas Tischler

Project Manager at the BMW Classic Center

What expertise is required to prepare classics like the BMW 328 cars for a race?

It definitely takes a fully-equipped specialist workshop, like the BMW Classic Center, and needless to say, the relevant experts. Our mechanics have years of experience, as well as the necessary dexterity to deal with pre-war technology. Worldwide connections to international specialist companies are also very important. They often deliver missing parts or tailor-make them by hand according to the original specification.

Since the organizers of the Mille Miglia attach great importance to originality, some of the BMW 328 models had to be retrofitted. Why is that?

The vehicles are used in completely different ways: at one point they go on a Sunday drive through the Alps, at another point they contend in a sporting competition. We're walking on a fine line: to participate in the Mille Miglia, the vehicles must be as original as possible, but also as efficient as they used to be. Some people forget that there are 70 years, and in most cases thousands of kilometres, between then and now.

Are any specific skills required to drive a BMW 328?

Of course, you can't compare a pre-war vehicle to a modern car. They have a lot of peculiarities, for instance direct steering and shifting gears with a double-declutch. Operating the stopwatches simultaneously also requires some exercise. Therefore, drivers receive special training beforehand, almost the way they did 70 years ago.

← LEFT Preparing the Mille Miglia vehicles requires a lot of precision and dexterity. Dieter Wende (pictures 1 and 3 from the left) and his colleagues Max Flückiger (picture 4) and Oliver Landinger (above) working in the BMW Classic Center.

The FIVA requires, for example, that the now-common telescopic shock absorbers be replaced with lever-type shock absorbers. "The lever-type shock absorbers are the original ones, but compared to the hydraulic ones, they complicate driving the 328 models, especially when driving at the limit. Many of them were subsequently retrofitted because of this", Kutscher explains. It is not always easy to acquire original or identically constructed parts. The lever-type shock absorbers are not causing Kutscher any trouble though; "they are still used for tram railcars," says the master mechanic knowingly.

The shopping list is long: five vehicles need to be retrofitted – two of the home-comers from abroad and three production models, whose FIVA passports must be renewed regularly. The three active vehicles must be deprived of their anti-roll bars and Watt linkages. The electronics, retrofitted from 6 to 12 volts, are, however, tolerated. All participating vehicles must also have flashing warning lights; these are not original, but statutory.

This affects the home-comers again, including a silver BMW 328 from 1939, which has been standing in museums for decades. "It is probably the most original model from our collection, making any modification really painful," explains Dieter Wende, one of the mechanics. The expert on pre-war vehicles explains, "the car is still fitted with a Hurth transmission and needs to be driven with a double-declutch," making the modifications especially challenging. Like all race cars lining up at the Mille Miglia, the silver returnee will not only be equipped with the warning light, but it will also undergo a comprehensive inspection and receive new tyres, and its brakes will be worked on.

It also requires a lot of work to render the silver BMW 328 Frazer-Nash from Great Britain fit for racing again. Like the BMW 328 from China, it was on show for decades in an exhibition in England. "We don't know whether it has ever been moved or not. For this reason, we have taken the car almost completely to pieces before it can compete", Wende explains whilst mounting a new cylinder head into the race car, a procedure which is not only cumbersome but also expensive. One such part re-manufactured according to its original state costs about 9,000 Euro. And that is not all. Wende lists off everything it needs: "cylinder head, distributor tower and distributor, lever-type shock absorber, and a new fuel tank – the Frazer-Nash is really giving us a hard time."

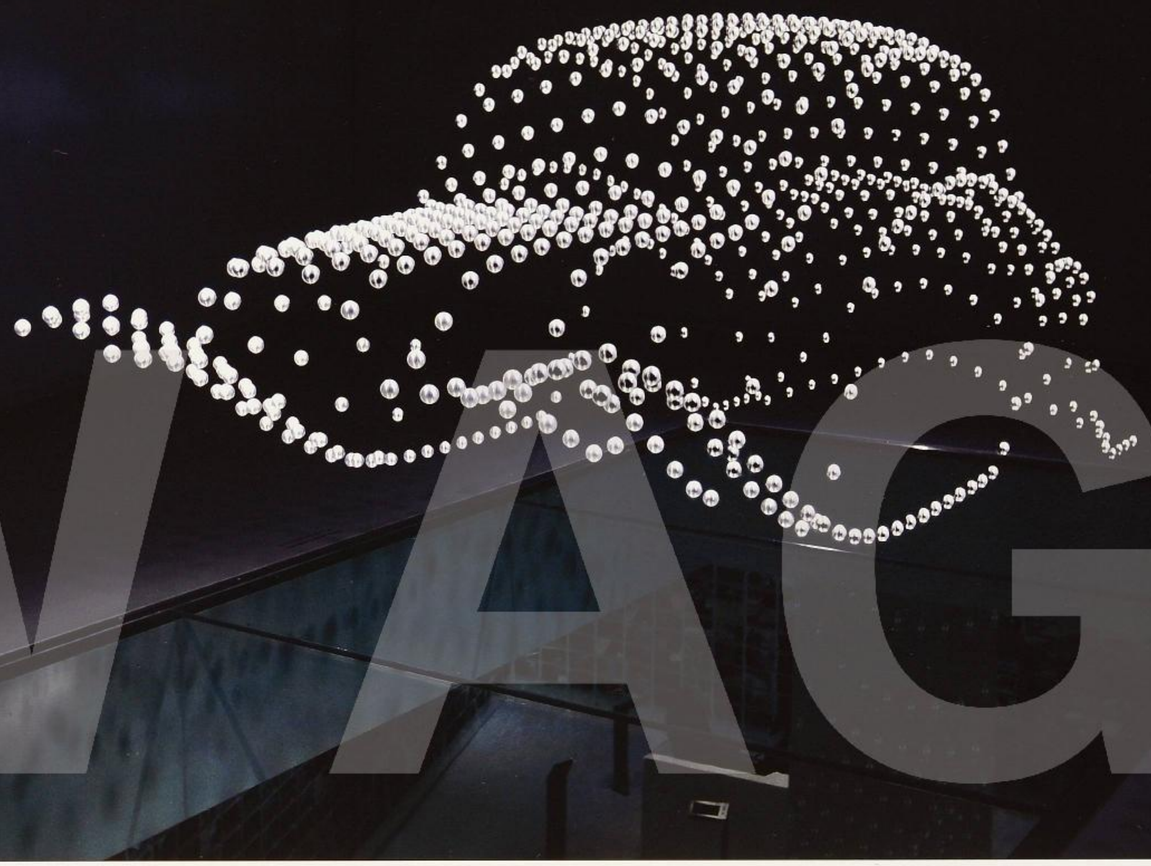
Wende and Kutscher are, nevertheless, in good spirits. They are on schedule. Almost half time and half of the racing fleet is already ready. Wende and his colleagues have a checklist for each vehicle, which they meticulously work through; just as their colleagues did 70 years ago.

Preview

ENDLESS PLAINS, DUSTY DESERTS, MUDDY FOREST TRAILS.

The BMW GS Models stand for adventure journeys, sheer riding pleasure, and freedom like no other motorcycle. Thirty years ago BMW launched the first GS, the BMW R 80 G/S, which was the world's strongest and largest Enduro at the time. With this model, BMW not only established a segment of its own but also wrote an unrivalled story of success.

The "BMW Classic live 30 years of GS Special" is set to be published in May 2010. It will be available from your BMW dealer, or in Munich from either the BMW Classic Shop, Schleißheimer St. 416, or in the shop of the BMW Museum.



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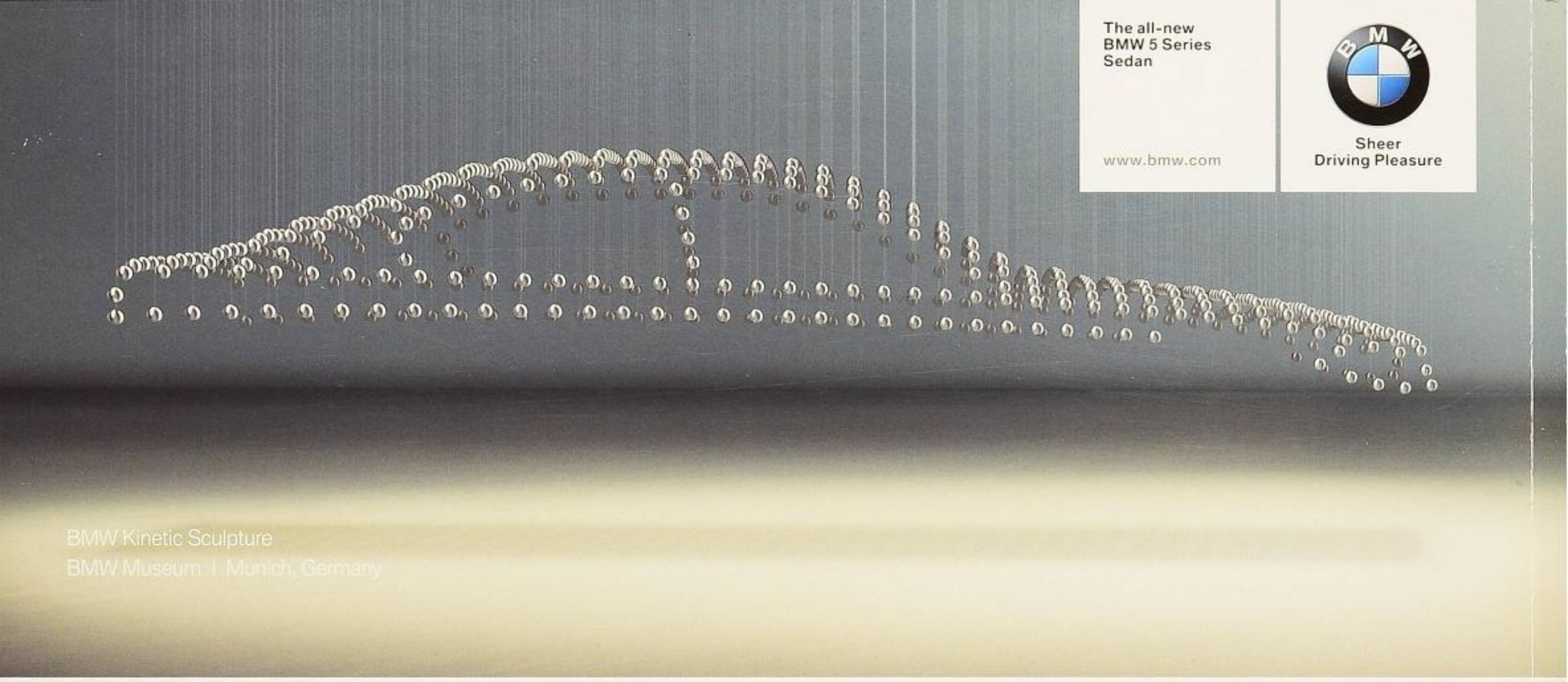

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