

BMW Motorsport



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# Formula

BMW.Williams



# Formula 1

in everybody's mind

**Leadership starts in your mind – particularly when it comes to leadership in the market. This applies to all segments in which BMW is represented, also to Formula 1. After 13 years BMW has re-entered this supreme category of motorsport in a simply perfect come-back, convincing even the most sceptical critic. So not only motorsport fans are thrilled, also BMW's own employees are fascinated by this competition for supreme technology, utmost skill and outstanding results. Which is precisely why all members of the team gave their best right from the start in the first season to see Ralf Schumacher and Jenson Button among the three best drivers. Features having proven their qualities on the race-track also go into BMW's production cars – to the benefit of the customer. The latest examples are the BMW M3 and M3 convertible allowing the driver to shift gears without even taking his hands off the steering wheel – the feeling of Formula 1 at its best.**

## BMW in Formula 1: returning to the highest realms of motorsport

After a break of almost 13 years BMW has returned to Formula 1 with the BMW WilliamsF1 Team. And finishing third in the Constructor's World Championship, the team supporting drivers Ralf Schumacher and Jenson Button immediately marked the most successful re-entry of an engine constructor into Formula 1 in 33 years. The supreme reliability of BMW engines consistently developed to an ever-increasing standard, the professional quality of the entire team prior to and during the races, and the popular appearance of the team has helped to give BMW an even greater name.

Participating in Formula 1 is far more to BMW, however, than enjoying the most fascinating world of motorsport. For the technologies, materials and processes tried and tested in Formula 1 may go straight into series production, thus helping to maintain and enhance BMW's leadership in technology.

Motorsport is furthermore the classic opportunity for a car maker to demonstrate his superior technological performance also under maximum competitive pressure. Particularly BMW has a very long and successful tradition in motorsport culminating so far in the 1983 Formula 1 World Championship.

Motorsport and Formula 1 are a perfect match for BMW, underlining the features and values so typical of the brand: sporting performance, a dynamic mind, innovative technology,

a supreme commitment and fast reactions in fierce competition with the best.

## The 2001 Formula 1 season: taking on a new challenge

After finishing third in the Constructor's World Championship in their very first season, the BMW WilliamsF1 Team has to meet great public expectations for the year 2001 season. And clearly, the objective for the new season, having started in Australia on 4 March, is to follow in the footsteps of last year's successes.

This year the BMW WilliamsF1 Team is entering the season with a new engine, a new tyre supplier, and a new driver. The year-2001 BMW V10 is not an evolution version of the former engine, but rather an all-new power unit from the ground up. The great challenge facing the engineers at BMW's Research and Development Centre was indeed to make the new engine even lighter and smaller but also more powerful and reliable.

Joining forces with Michelin, the BMW WilliamsF1 Team has a new supplier of tyres for the 2001 season. Comprehensive tests were already conducted with Michelin during the year 2000 season in order to ensure a perfect balance of tyres and suspension this year. And in the 2001 season Juan Pablo Montoya takes over the place of Jenson Button, who will be driving for the Benetton Team until the year 2003. The former Formula 3000 European Champion and the US CART Champion, Colombian driver Montoya is an important new addition to the BMW WilliamsF1 Team.







# Formula 1

in everybody's mind



Only very few drivers get to enjoy a BMW WilliamsF1 Team's racing car. But before they are able to do so dozens of specialists make every effort to improve the car's technologies to a supreme standard. Teamwork is always in the minds of the experts at the Munich Development Centre.







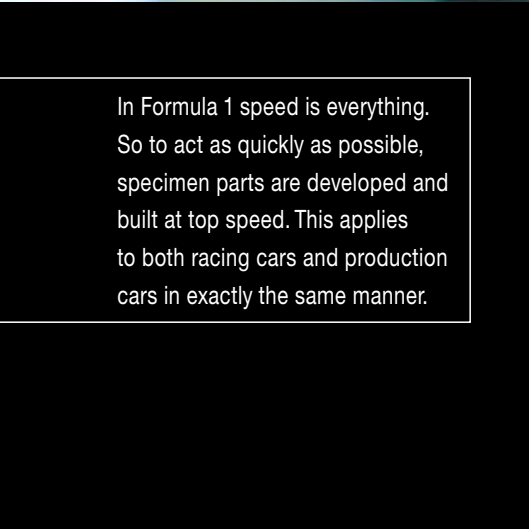
# Form







in everybody's mind



In Formula 1 speed is everything. So to act as quickly as possible, specimen parts are developed and built at top speed. This applies to both racing cars and production cars in exactly the same manner.



**Formula 1** in everybody's mind







The BMW V10 racing engine is developed and built with extreme precision – precision also to be found in BMW's production engines.





To be a genuine leader you must invest in man and machine. The BMW V10 racing engine is built in Munich. For the name Bayerische Motoren Werke is no coincidence.

## Engine management: synergies between Formula 1 and series production

Bayerische Motoren Werke – the name alone is a commitment. So it was clear almost immediately in preparing BMW's entry into Formula 1 that, unlike most other Formula 1 teams, BMW would not obtain the engine management (the so-called BlackBox) from suppliers, but rather develop everything at the BMW Group's Research and Development Centre in Munich. The very same BMW engineers responsible for developing the engine management of BMW's M3 and M5 production models therefore did the same excellent job for the Formula 1 project. And in the meantime this electronic system, proven under the toughest racing conditions, has provided a whole world of new ideas and know-how going into the next generation of BMW engines – direct transfer, therefore, from Formula 1 to series production.

## Innovative materials: Formula 1 as a test laboratory

There has always been an apparent contradiction in motorsport: A component must be as light as possible, but as strong as necessary. And both the mechanical and thermal loads acting on a Formula 1 power unit are so great that Formula 1 is an ideal, unique test opportunity for BMW's engineers and other specialists.

The specialists at BMW's Research and Development Centre support BMW's Motorsport Department in their laboratories with their testing facilities and through their know-how, for example in testing the strongest and lightest alloys or in trying out new materials carried over from aerospace technology.

Precisely this explains why the Research and Development Centre already focuses on materials currently still too exotic and expensive for series production. Through Formula 1 BMW's engineers are therefore able to make themselves acquainted with these materials, paving the way for their rapid introduction in BMW's production models.

## Rapid prototyping: developing specimen parts at Formula 1 speed

Speed is everything in motorsport. And precisely this is why BMW's Motorsport Department supplying the BMW WilliamsF1 Team with V10 power units uses parts and components developed through rapid prototyping in the concept and test phase. Computer-aided machines using stereo-lithography, multi-jet modelling or 3 D printing are able to produce true-to-scale models from resin, plastic powder, starch or wax quickly and inexpensively.

This enables BMW's engineers to quickly and efficiently test the installation of new parts or their interaction with other components right from the start in the technical drafting and development phase, using prototypes made at very short notice. Application of these ultra-modern technologies shortens development periods, reduces the cost of development, and gives not just the BMW WilliamsF1 Team, but also the specialists developing series production models, a decisive lead over the competition.

## The Landshut foundry: building engine components for Formula 1 and regular production models

The large number of in-house parts and components already used on BMW's V10 racing engine has increased once again for the year 2001.



# Formula 1

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Good neighbours: the cylinder heads for BMW's production engines and for the F1 power unit are built right next to one another. Short distances ensure a smooth and efficient transfer of know-how.





Formula 1 technology is to be found not only in motor-sport. For the BMW M3 also comprises Formula 1 features, allowing the driver to shift gears without taking his hands off the steering wheel – motor racing at its best.



Formula 1 in everybody's mind

Now BMW also makes the cylinder head, crankcase, camshaft and crankshaft. To make this possible an entirely new Formula 1 foundry as well as a complete machining shop were established and opened up within a period of less than 12 months. A particularly remarkable point in this context is that both of these facilities are not run by BMW's Motorsport Department, but rather by the corporate divisions responsible for regular series production: the foundry for BMW's Formula 1 V10 is in Landshut, Germany, right next to the "conventional" foundry for production engines. This allows know-how gained in motorsport to go straight into series production.

### SMG II sequential gearbox with DRIVELOGIC – transmission technology from the BMW WilliamsF1

Shifting without taking your hands off the steering wheel – so far this was only possible in Formula 1. But now you can also enjoy this amenity in a BMW production car. Like in Formula 1, the SMG II sequential gearbox with DRIVELOGIC available as an option in the BMW M3 and M3 convertible allows the driver to shift gears directly by toggle switches on the steering wheel. And like the instruments in the cockpit of a Formula 1, shift lights in the rev counter coming on one after the other inform the driver that he is approaching the optimum shift speed, guaranteeing a genuine Formula 1 feeling in the process.

Shifting gears with SMG II is a quick, precise and safe process. With gearshift times reduced to just 80 milliseconds, SMG II offers

the fastest shift process compared with all other cars in the market. Signals are transmitted redundantly by electronic by-wire technology, with absolute reliability and safety at all times.

DRIVELOGIC provides 11 driving programs in the sequential and automatic modes ranging from well-balanced and dynamic all the way to sporting with supreme performance.

Developing SMG II, the BMW Group has created a transmission combining the sporting qualities of a Formula 1 gearbox with the requirements of everyday motoring in a perfect symbiosis.

#### The 2001 Formula 1 season

04 March	Australian GP in Melbourne
18 March	Malaysian GP in Kuala Lumpur
01 April	Brazilian GP in São Paulo
15 April	San Marino GP in Imola
29 April	Spanish GP in Barcelona
13 May	Austrian GP in Spielberg
27 May	Monaco GP in Monte Carlo
10 June	Canadian GP in Montreal
24 June	European GP at Nürburgring
01 July	French GP in Magny-Cours
15 July	British GP in Silverstone
29 July	German GP in Hockenheim
19 August	Hungarian GP in Budapest
02 September	Belgian GP in Spa
16 September	Italian GP in Monza
30 September	USA GP in Indianapolis
14 October	Japanese GP in Suzuka