



Media information
04 August 2022

Ultimate driving dynamics: BMW M GmbH begins concept testing for all-electric high-performance models.

First test drives with a prototype for innovative drive and chassis control systems commence. Four electric motors and an integrated driving dynamics control system enable an extremely emotional driving experience in future high-performance sports cars.

Munich. BMW M GmbH is opening the next chapter in its transformation towards electric mobility. With the first test drives of a so-called concept test vehicle for innovative drive and chassis control systems, a multidisciplinary team of developers is now putting to test the hardware and software solutions designed for future fully electric high-performance cars. The concept testing focuses on a four-wheel drive system comprising four electric motors and an integrated driving dynamics control system, which together provide an unprecedented level of performance and experience.

With the completely new drive concept, BMW M GmbH is underscoring its development expertise and, therefore, also its ability to transfer the essence of the letter M into the world of locally emission-free mobility. The purely electric drive system is combined with innovative control systems to redefine the combination of dynamics, agility and precision that is characteristic of BMW M automobiles in a high-performance sports car.

50 years of BMW M GmbH: The future begins in the anniversary year.

Exactly 50 years after its foundation, BMW M GmbH is in the midst of a transformation process towards electric mobility, which not only preserves the unmistakable performance characteristics of its models, but at the same time enriches them with new facets. The anniversary year has already seen the market launch of the all-electric BMW i4 M50 performance car (combined power consumption: 22.5 – 18.0 kWh/100 km according to WLTP; CO2 emissions: 0 g/km; data according to NEDC: –) and the BMW iX M60 (combined power consumption: 24.5 – 21.9 kWh/100 km according to WLTP; CO2 emissions: 0 g/km; data according to NEDC: –). And the BMW i7 M70, the first BMW M automobile based on an all-electric luxury sedan, is to follow as early as next year.



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"On our anniversary, we are not only looking back, but above all also looking forward," says Franciscus van Meel, Chairman of the Board of Management of BMW M GmbH. "Before the end of the year, production of the BMW XM, our first high-performance car featuring a V8 M hybrid drive, will commence. Together with our fans all over the world, we are also looking forward to our entry into the LMDh category of the North American IMSA endurance racing series, in which we will also be competing with an eight-cylinder hybrid turbo engine in Daytona and at other events in 2023, as well as in the WEC racing series at Le Mans a year later."

Specific drive and suspension technology in the guise of a BMW i4 M50.

In order to now bring the drive and chassis technology designed for future, purely electric high-performance cars onto the road for test and tuning drives, the engineers at BMW M GmbH have developed a test vehicle that carries the appropriate genes – both in terms of typical M dynamics and in the field of electric mobility. Based on the BMW i4 M50, a purely electrically powered coupe has been created with a modified body in typical BMW M GmbH style, the wide wheel arches of which permit the integration of specifically manufactured high-performance front and rear axle designs.

The front end of the vehicle features an adapted body strut concept taken from the BMW M3/ M4 series for particularly high torsional rigidity in extremely dynamic driving situations. The arrangement of the radiator units is also based on the configuration developed for the current high-performance sports cars.

Extremely precise, extremely variable: M xDrive four-wheel drive system with four electric motors.

The core of the revolutionary high-performance drive system now making its debut on the road in the test vehicle is an electric M xDrive four-wheel drive system with four electric motors. The fact that all four wheels are each driven by an electric motor opens up completely new possibilities for infinitely variable, extremely precise and at the same time very fast distribution of drive torque. Within milliseconds, the power and torque of the spontaneously reacting electric motors can be dosed so precisely that the load demand signalled via the



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accelerator pedal can be realised at a level of dynamics that is unattainable using conventional drive systems.

This means that the driver is able to experience entirely new performance characteristics even under extremely demanding conditions such as in highly dynamic situations or adverse road conditions. "Electrification opens up completely new degrees of freedom for us to create M-typical dynamics," says Dirk Häcker, Head of Development at BMW M GmbH. "And we can already see that we can exploit this potential to the maximum, so that our high-performance sports cars will continue to offer the M-typical and incomparable combination of dynamics, agility and precision in the locally emission-free future."

Highly integrated control unit for vehicle dynamics and drive control.

The precision during the transfer of drive torque in particular benefits significantly from the electric M xDrive four-wheel drive system. The four motors are connected to a central, highly integrated control unit that permanently monitors the driving condition and the driver's wishes. The ideal power transmission to the road is calculated within milliseconds from the values for the accelerator pedal position, steering angle, longitudinal and lateral acceleration, wheel speeds and other parameters. The signals for this are transmitted just as quickly and directly via a multi-plate clutch and differentials to the four motors, which are able to implement them immediately and precisely.

This form of vehicle dynamics and drive control was brought to practical maturity in intensive development and test phases, initially on virtual models and then on test benches. For completely realistic application of the hardware and software developed for this purpose, the concept test vehicle is now being put on the road. The interior of the four-door coupe is equipped with extensive measuring technology that can be used to analyse in detail every completed driving situation. In this way, the theoretical results for the perfect distribution of drive torque can be compared in the rolling test laboratory with reality on the road and taken into account for further programming.



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This detailed work is crucial to ensure that future high-performance models will also be characterised by exactly what has rendered BMW M automobiles unmistakable for the last 50 years: a linear build-up of drive power and lateral dynamics that permits controllable handling right up to the limits. The fact that this limit range is shifted even further by the pioneering drive principle was already apparent during the first test kilometres of the concept test vehicle on closed-off roads. Thanks to the particularly sensitive dosage of drive torque and conversion without perceptible latency, significantly higher cornering speeds can be achieved, even on rain-soaked or snow-covered roads, for example. In this case, the vehicle steers effortlessly and without a tendency to understeer, as the drive torque for the outside rear wheel has already been increased parallel to the steering angle.

The high-performance character of the new drive system is also evident in the recuperation of braking energy. Right up to the limits of driving dynamics, the four motors can assume the function of a generator when braking before a bend, for example, and feed electricity back into the high-voltage battery.

Die Angaben zu Kraftstoffverbrauch, CO₂-Emissionen, Stromverbrauch und Reichweite werden nach dem vorgeschriebenen Messverfahren VO (EU) 2007/715 in der jeweils geltenden Fassung ermittelt. Sie beziehen sich auf Fahrzeuge auf dem Automobilmarkt in Deutschland. Bei Spannbreiten berücksichtigen die Angaben die Auswirkungen jeglicher Sonderausstattung.

Alle Angaben sind bereits auf Basis des neuen WLTP-Testzyklus ermittelt. Für die Bemessung von Steuern und anderen fahrzeugbezogenen Abgaben, die (auch) auf den CO₂-Ausstoß abstellen, sowie gegebenenfalls für die Zwecke von fahrzeugspezifischen Förderungen werden WLTP-Werte zugrunde gelegt. Weitere Informationen zu den Messverfahren WLTP und NEFZ sind auch unter www.bmw.de/wltp zu finden.

Weitere Informationen zum offiziellen Kraftstoffverbrauch und den offiziellen spezifischen CO₂-Emissionen neuer Personenkraftwagen können dem 'Leitfaden über den Kraftstoffverbrauch, die CO₂-Emissionen und den Stromverbrauch neuer Personenkraftwagen' entnommen werden, der an allen Verkaufsstellen, bei der Deutschen Automobil Treuhand GmbH (DAT), Hellmuth-Hirth-Str. 1, 73760 Ostfildern-Scharnhausen, und unter <https://www.dat.de/co2/> unentgeltlich erhältlich ist.

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Die BMW Group

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Im Jahr 2021 erzielte die BMW Group einen weltweiten Absatz von mehr als 2,5 Mio. Automobilen und über 194.000 Motorrädern. Das Ergebnis vor Steuern im Geschäftsjahr 2021 belief sich auf 16,1 Mrd. €, der Umsatz auf 111,2 Mrd. €. Zum 31. Dezember 2021 beschäftigte das Unternehmen weltweit 118.909 Mitarbeiterinnen und Mitarbeiter.

Seit jeher sind langfristiges Denken und verantwortungsvolles Handeln die Grundlage des wirtschaftlichen Erfolges der BMW Group. Das Unternehmen hat frühzeitig die Weichen für die Zukunft gestellt und rückt Nachhaltigkeit und Ressourcenschonung konsequent ins Zentrum seiner Ausrichtung, von der Lieferkette über die Produktion bis zum Ende der Nutzungsphase aller Produkte.

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