

Media information
17 February 2025

Endurance test for “Heart of Joy”: the BMW Vision Driving Experience.

Top-class dynamics, precision, efficiency and driving pleasure +++ New “Heart of Joy” central computer works ten times faster +++ Extending the recuperation range increases efficiency by 25% +++

Spartanburg / Munich. Showcasing driving pleasure up to the physical limits is the BMW Group's mission with its new high-performance test vehicle – the BMW Vision Driving Experience. This Vision Vehicle is not destined for series production, but is instead serving as a rolling test rig for drivetrain and driving dynamics management technology developed specially for the Neue Klasse – the next generation of BMW vehicles – and referred to by BMW as the “Heart of Joy”. The prototype car put the capabilities of the Heart of Joy to the ultimate test of endurance at the BMW Performance Driving Center in Spartanburg, USA. And the company provided exclusive insights into its development programme for the electric driving experience on board the Neue Klasse as part of a preview presentation. Every fully electric Neue Klasse model will benefit from the Heart of Joy. The first taller Neue Klasse electric model will go into series production later this year at Plant Debrecen in Hungary. The new Heart of Joy adds a fourth dimension – BMW's hallmark Sheer Driving Pleasure – to the existing trio of Neue Klasse characteristics (electrical, digital, circular). Oliver Zipse, Chairman of the Board of Management of BMW AG, took to the stage at the IAA 2023 show holding the small black box. It is important to note that the control unit will go into series production, but the Vision Vehicle will not.

“The Heart of Joy enables us to take driving pleasure not just to the next level, but another one beyond that,” says Frank Weber, member of the Board of Management of BMW AG, responsible for Development. “In addition, we are further increasing efficiency, and therefore boosting range, as in future the driver will brake almost exclusively using energy regeneration. This is Efficient Dynamics squared.”

Computer processing now ten times faster

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The Heart of Joy control unit for the drivetrain, brakes, charging, recuperation and steering subfunctions processes information ten times faster than previous systems. Working in tandem with the BMW Dynamic Performance Control software, the Heart of Joy computes all the driving dynamics functions with a whole new level of speed and precision. The software has been developed entirely in-house on the back of experience in the field of driving dynamics amassed by BMW engineers over more than a century. The Vision Vehicle develops 18,000 Newton metres (13,269 lb-ft) of torque. The reasoning behind this is that if the control system can deal with an explosion of power of this magnitude, it will be able to handle the demands of everyday driving with ease.

Energy recovery under braking (also known as recuperation) sees the drivetrain and braking functions of electric vehicles forming a symbiosis. In the innovative electronics architecture of the Neue Klasse, the Heart of Joy is one of four central control units and combines drivetrain and driving dynamics functions for the first time. These innovative control functions are protected by several patent applications. The high-performance unit controls acceleration and braking, vehicle stabilisation, dynamic steering functions and charging management. The central processing unit and perfectly coordinated BMW Dynamic Performance Control software developed in-house enable all connected actuators to respond directly and with minimal delay: latencies are in the millisecond range. By contrast, conventional systems have separate control algorithms for the drive system and brakes. This means the full handling potential of vehicles with powerful electric drive systems cannot be fully exploited.

Precise cornering and the smoothest stopping process in the history of the car

The driver and passengers here experience a harmonious and noiseless driving feeling – regardless of the situation and speed they are travelling at. In dynamic driving scenarios, the new Heart of Joy / BMW Dynamic Performance Control combination serves up cornering poise and assurance beyond compare. The car generates impressive traction and can be threaded through corners with

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exceptional precision. Fewer control inputs are required and the car's line can be maintained with greater precision and stability. This helps the car to develop consistent, reproducible cornering behaviour and allows it to be steered more intuitively and smoothly. At low speeds – such as in stop-start driving or when parking – direct signal transmissions and rapid information processing ensure an even more compelling driving experience. In driving modes D or B, or when using Active Cruise Control, the parking brake or parking lock, stopping and restarting merge seamlessly into one another.

Recuperation fuels a 25 per cent increase in efficiency

Furthermore, integrated drivetrain, braking and energy recuperation control allows energy to be used more sustainably. 98 per cent of drivers do not need to make any inputs using the conventional brakes. The braking power generated using energy recuperation is sufficient for normal, everyday driving. Only under heavy braking, e.g. in an emergency situation, is intervention required from the friction brakes. All in all, this system increases efficiency by up to 25 per cent.

The BMW Vision Driving Experience test vehicle demonstrates how the Heart of Joy works using illuminating colour codes on the wheel rims: acceleration is indicated in green, energy recuperation in blue and braking using the friction brakes in orange.

Four totally new superbrains will go to work in the BMW of the future. These high-performance computers cleverly combine various elements that previously ran separately. The superbrain Heart of Joy was developed 100 percent within the company. It allows four important control units to be brought together within a single high-performance computer.

Another three superbrains are responsible for features including automated and highly automated driving, infotainment and basic functions such as climate control and comfort-enhancing systems, vehicle access, interior and exterior lighting.

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World Premiere at Shanghai Auto Show

The BMW Vision Driving Experience will celebrate its official world premiere at Auto Shanghai 2025.

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The BMW Group

With its four brands BMW, MINI, Rolls-Royce and BMW Motorrad, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial services. The BMW Group production network comprises over 30 production sites worldwide; the company has a global sales network in more than 140 countries.

In 2024, the BMW Group sold 2.45 million passenger vehicles and more than 210,000 motorcycles worldwide. The profit before tax in the financial year 2023 was € 17.1 billion on revenues amounting to € 155.5 billion. As of 31 December 2023, the BMW Group had a workforce of 154,950 employees.

The economic success of the BMW Group has always been based on long-term thinking and responsible action. Sustainability is a key element of the BMW Group's corporate strategy and covers all products from the supply chain and production to the end of their useful life.

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