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

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

Woodcliff Lake, NJ – February 16, 2025...Showcasing driving pleasure up to the physical limits is BMW’s mission with its new high-performance test vehicle – the BMW Vision Driving Experience. This Vision Vehicle is not destined for 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 vehicle put the capabilities of the Heart of Joy to the ultimate test of endurance at the BMW Performance Center in Spartanburg, SC, and BMW provided exclusive insights into its development program 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 Neue Klasse 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 characteristic driving pleasure – to the existing portfolio of Neue Klasse characteristics (electric, digital, and 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.

“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.”

It is important to note that the control unit will go into series production, but the Vision Vehicle will not.

Computer processing now ten times faster.

The Heart of Joy control unit for the drivetrain, brakes, charging, recuperation, and steering functions 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 control unit has been developed entirely in-house using knowledge gained in the field of driving dynamics amassed by BMW engineers over more than a century. The Vision Vehicle develops 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 (recuperation) sees the drivetrain and braking functions of electric vehicles working symbiotically. In the innovative electronics architecture of the Neue Klasse, the Heart of Joy is one of four central 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 stabilization, 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 smooth braking.

The driver and passengers 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 delivers cornering poise and assurance beyond compare. The vehicle generates impressive traction and can be threaded through corners with exceptional precision. Fewer control inputs are required and the vehicle's line can be maintained with greater precision and stability. This helps the vehicle to develop consistent cornering behavior and allows it to be steered more intuitively and smoothly. At low speeds – such as in stop-and-go driving or when parking – direct signal transmissions and rapid information processing ensure a compelling driving experience. In driving modes D or B, or when using Active Cruise Control, the parking brake, or Auto Hold, stopping and restarting merge seamlessly into one another.

Recuperation fuels a 25% increase in efficiency.

Furthermore, integrated drivetrain, braking, and energy recuperation control allows energy to be used more sustainably. Drivers will not need to apply the conventional brakes in most situations. 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%.

The BMW Vision Driving Experience test vehicle visually demonstrates how the Heart of Joy is working through displays of color on the wheels: acceleration is indicated in green, energy recuperation in blue, and braking using the friction brakes in orange.

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

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

BMW Group in the United States.

BMW of North America, LLC was established 50 years ago to support the sales, marketing and distribution of BMW automobiles and motorcycles in the U.S. In 1993 BMW Group Financial

Services NA, LLC was founded, and one year later BMW Manufacturing Co., LLC began assembling vehicles in South Carolina. In 2002 and 2003, BMW Group established MINI USA, and Rolls-Royce Motor Cars NA, LLC relaunching two iconic brands and rounding out its product portfolio.

Today, the BMW Group has a nationwide corporate footprint in the U.S. which consists of nearly 30 locations in 12 different states. Beyond the National Sales Company and Financial Services headquarters in Woodcliff Lake, NJ, its manufacturing plant in Spartanburg, South Carolina, and numerous other operational facilities, BMW Group in the U.S. also includes Designworks, a strategic design consultancy in Santa Monica, CA, BMW Group Technology Office USA, a technology research and development center in Silicon Valley, and BMW i Ventures, a venture capital fund, also in Silicon Valley.

BMW Group Plant Spartanburg is the largest single BMW production facility in the world, and the global center of competence for BMW Sports Activity Vehicles including the X3, X4, X5, X6, X7, and XM. The plant assembles more than 1,500 vehicles each day, and up to 450,000 annually. Since 1994, Plant Spartanburg has assembled nearly 7 million BMW vehicles in the U.S.

The BMW Group sales organization in the U.S. is represented through a network of 350 BMW retailers, 147 BMW motorcycle retailers, 104 MINI passenger car dealers, and 38 Rolls-Royce Motor Car dealers. The company's activities provide and support over 120,000 jobs across the U.S. and contribute more than 43.3 billion to the U.S. economy annually.

Journalist note: Information about BMW Group and its products in the USA is available to journalists online at www.bmwusanews.com , www.miniusanews.com, and at www.press.bmwna.com

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