



Media Information  
October 28<sup>th</sup> 2011

## **BMW Head-Up Display: Precision as featured in a fighter jet.**

**This system was initially developed for aviation and is now making a decisive contribution towards driving safety.**

**Munich.** Low-flying over hilly terrain at a speed of almost 800 kilometres per hour in the cockpit of a Eurofighter jet is a challenge to even the most hardened of military pilots. "When you're flying at tree-top height at around 220 metres a second, only extremely accurate head-up display technology is able to provide the necessary ease of mind," comments Wing Commander Robert Hierl, test pilot at the Technical and Airworthiness Centre for Aircraft.

By means of a front panel projector, all flight-relevant data supplied by the flight management system as well as information and signals crucial to a mission are displayed on a second, vertically positioned panel located in the cockpit.

In order to prevent the pilot from being distracted, all information is displayed in virtual form at eye level within the direct field of vision, thus guaranteeing the highest degree of concentration, supremacy and safety for both the pilot and the machine.

BMW was the first European car builder to adapt head-up display technology – a system initially deployed in aviation and constantly further developed over several decades – for use in volume-production vehicles. Since January 2004, this innovative driver assistance system has been an integral part of BMW ConnectedDrive offered for the BMW 5 Series. Consistently further developed and optimised, it is now a full-colour head-up display and optionally available for almost all series.

In terms of graphic representation, functionality and flexibility, the unique new Head-Up Display feature makes a significant contribution towards active safety by displaying driver-relevant information in high-quality resolution within the driver's direct field of vision, so that he or she does not have to take their eyes off the road. A crucial gain in safety as researchers know: A normal driver takes a whole second to read the speed indicator in the instrument panel or to glance at

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the navigation device. Whilst the driver is distracted, that is without his or her eyes on the road, the vehicle covers a distance of around 14 metres when travelling in urban areas at a speed of 50 km/h – virtually a “blind flight”.

With Head-Up Display, the time required by the driver to assimilate information is reduced by more than a half, the system making a decisive contribution towards concentrated and focused driving. The virtual image projected onto the windscreen is perceived as “hovering“ at eye level above the bonnet and is visible only to the driver. Moreover, this form of display is less tiring, as the eye does not have to constantly change between close-range and remote vision. Also, the brightness of the image adjusts perfectly to the surroundings, so that the eye does not have to readapt each time.

The reproduction of data is effected by means of an intense light source, which is located inside the instrument panel and shines through a translucent TFT (Thin Film Transistor) display, the image being transferred to the windscreen via specially shaped mirrors. Owing to the convex shape and the physical properties of glass, using the windscreen as a reflector is an extremely complex process. In a windscreen, the light path is normally refracted, resulting in double images.

In the case of the Eurofighter, this problem is solved by means of an additional panel located directly within the pilot’s field of vision. BMW tackles this physical phenomenon with the aid of a wafer-thin foil, which is integrated into the windscreen, ensuring the superimposition of the projected images and, as a result, flawless, undistorted representation. Full-colour Head-Up Display offers the driver a tremendous increase in reading comfort. The complete colour spectrum facilitates a realistic and thus more intuitive display of images and symbols. These speak for themselves, are perceived even faster and do not have to be decoded or interpreted. Even Eurofighter test pilot Robert Hierl is highly impressed: “Our monochrome head-up display technology is unable to offer such a brilliant display quality.”



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During the financial year 2010, the BMW Group sold 1.46 million cars and more than 110,000 motorcycles worldwide. The profit before tax for 2010 was euro 4.8 billion on revenues amounting to euro 60.5 billion. At 31 December 2010, the BMW Group had a workforce of approximately 95,500 employees.

The success of the BMW Group has always been built on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy. As a result of its efforts, the BMW Group has been ranked industry leader in the Dow Jones Sustainability Indexes for the last seven years.