

 BMW is the first European automotive manufacturer to provide an intelligent forward- looking camera technology for driver assistance — warning motorists *before* they drift inattentively across a marked lane potentially into harm's way.

 Siemens VDO and Mobileye N.V. have collaborated over the past few years in the development and testing of the advanced Lane Departure Warning (LDW) system on a wide range of weather conditions, road types and lane markings in Europe, North America, Asia and Africa. The system consists of a high dynamic range digital CMOS camera and a high performance electronic control unit with advanced algorithm technology for video based lane marking recognition.

 Advanced lane departure warning is superior to basic LDW technology because it alerts drivers *prior* to lane change that they are edging close to the lane mark without using their turn signal. If a driver is already crossing the line, it may be too late for a warning.

 The BMW advance LDW vision system warns of potential lane departure by providing haptic warnings through simulated “rumble strip” vibration in the steering wheel. Lane marking availability is shown through a display in the instrument cluster and the head-up display if ordered by the customer. The LDW technology is one of a few systems that demonstrate “single lane marking availability” where a single lane marking is sufficient for detection, in contrast to systems that require lane markings on both sides. The system is also effective in snow and can differentiate between snow tire-marks and real lane markings. It can also detect construction areas or other situations where lane markings are ambiguous.

 The LDW technology will help motorists stay safe in diverse driving conditions including monotonous highways, where driver inattention is commonplace, as well as on curved roads. The system's warning duration varies depending on the speed that the vehicle crosses the lane marking, providing a short warning of under one second for quick lane changes, and in the case of a very slow drift across the lane marking, the warning will be longer—even up to several seconds.

 Advanced LDW is available on all new 5 Series and 6 Series models and is standard on 550i and 535d models.

 Statistics from the U.S. Transportation Research Board indicate that approximately 40 percent of all road fatalities occur when a single vehicle departs from the road and crashes. Rumble strips have reduced lane departure fatalities by up to 90 percent, and at times even more. The vibration of the steering wheel in BMW's new LDW system provides drivers with an advance lane departure warning even when there are no physical strips on the shoulder of the road. This feature is expected to greatly reduce the number of lane-departure-related accidents, which are a major cause of driver mortality on roads worldwide.

 The system is also able to distinguish between intentional and unintentional lane and directional change in other situations. Whenever the lanes become narrower or move sideways, for example in

road works on the motorway, the driver often has no choice but to drive over a marking line in order to follow provisional lanes marked with additional lines. The lane departure warning technology also registers such exceptions, not interpreting the intersection of several lines on the road shortly behind one another as a definite lane marking. The cockpit display indicates that the system has been temporarily deactivated, also giving the driver a clear signal to watch out in such an unpredictable traffic situation and maintain a higher level of awareness.

 A camera within the base the interior rear-view mirror generates high-resolution images of the area in front of the car.

 The system can detect construction areas or any other situation where there is ambiguity in lane marks. In such case the system turns off (no availability).

 The lane departure warning technology is activated at the touch of a button with a display in the instrument cluster between the speedometer and rev counter informing the driver that the system is operative.



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