

The world's first* road surface detection function for motorcycles is added

Further evolution of the motorcycle ADAS concept

(Advanced Driver Assistance Systems)

- Evolved form of the motorcycle ADAS concept announced at EICMA 2022 and EICMA 2023
- In-house stereo cameras adopted for forward detection and an ADAS ECU are placed in a distributed pattern. The two cameras can be separately attached, greatly improving their on-vehicle mountability.
- By utilizing stereoscopic vision, which is the benefit of stereo cameras, the world's first road surface detection (bump detection) has been realized* in addition to the conventional ADAS function for motorcycles.
- Using separate camera fixtures and separate camera lens protection covers has both improved the on-motorcycle mountability of the stereo cameras and reduced maintenance costs by protecting the lens.

*According to our survey



At EICMA 2024, we will exhibit a motorcycle ADAS concept that is additionally provided with a new road surface detection (bump detection) function while inheriting the functions of our previously announced motorcycle ADAS concept using stereo cameras for forward detection. The road surface detection function can alert the rider by detecting dangerous road surfaces ahead and also contribute to improving the safety of both the rider and the motorcycle through linkage with other electronic control devices. In addition, separate camera fixtures have been developed for mounting on the motorcycle the stereo cameras placed in a distributed pattern and separate camera lens protection covers.

In Europe and Asia, partially raised structures, called speed bumps, are formed on roads to control speed in urban areas. If a rider on a motorcycle runs over a speed bump unnoticed, he or she can easily lose balance and encounter an extremely dangerous situation. To protect riders from dangerous situations, we have added the world's first road surface detection (bump detection) function as a new

motorcycle ADAS function.

The object detection function and the features of the stereo cameras, which have an outstanding ability to recognize distances to objects, have further evolved and are capable of recognizing the heights of and distances to speed bumps on the road surfaces ahead in the direction of travel. The road surface detection function can contribute to higher safety through, for example, linking with other electronic control devices, including suspension control switching, accelerator operation, and intervening in the ABS system, based on the data.

At EICMA 2024 this time, we will exhibit a vehicle equipped with a front cowl on which a newly developed separate camera fixture for mounting a camera on the cowl and separate camera lens protection cover for protecting the camera lens from contamination and damage, and stereo cameras for ADAS will be mounted. By adopting a ball-joint shape for the connection face of the camera module, the angle of the camera can be adjusted after it is mounted on the cowl.

Furthermore, the camera lens protection cover, which is designed to be attached and detached independently, ensures easy mounting on the motorcycle. Even if the protection cover gets damaged by a flying stone, etc., it is independently replaceable and this can reduce maintenance costs. A water-repellent coating is applied to the camera lens protection cover and makes it contamination-resistant and easier to maintain.

At last year's ADAS exhibition, we also introduced mounting patterns of stereo cameras on the side view mirrors and mirror braces of a small-displacement scooter. Camera lens protection covers that have a water-repellent coating can be attached also to stereo cameras around those side view mirrors. The same benefits as those of stereo cameras for mounting on cowls can be obtained.

We announced our "motorcycle ADAS concept" for the first time at EICMA 2022. While many of the existing products use radar for forward detection, we apply our camera technology cultivated through ADAS's for automobiles that use in-house stereo cameras. We installed a system integrating stereo cameras and an ADAS ECU on vehicles. Based on the detection data obtained from this system, we linked systems, such as FCW (Forward Collision Warning), which activates when danger is detected, EBA (Emergency Brake Assist), which assists the rider in brake operation, and AEB (Automatic Emergency Braking), which actively operates the brakes. Linkage also with and control by our engine control system and electronically controlled suspension system developed in-house have realized alerting and deceleration operations that give the utmost consideration to the safety of riders and vehicles.

The evolved "motorcycle ADAS concept" we announced at EICMA 2023 has enabled us to independently mount two stereo cameras for forward detection. The ADAS ECU has also been significantly improved in on-motorcycle mountability as a result of being separate from the cameras and being placed in a distributed pattern.

We will further endeavor to contribute to motorcycle safety through proactive development of and proposals for motorcycle ADAS's, including the world's first road surface detection function for motorcycles we announced this year.

*Information contained in this Technical Information is current as of November 5, 2024 but may be subject to change without prior notice.