BWI Group’s EMB to Assure High-Level Autonomous Driving with Safety Redundancy

BWI Group's EMB is poised to be the ultimate solution for brake-by-wire, making future intelligent mobility more trustworthy.

The third generation of EMB, jointly developed by BWI Group and ThyssenKrupp, undergoes extreme cold dynamic testing in Arjeplog, Sweden, in March 2024

BEIJING, CHINA, June 4, 2024 /EINPresswire.com/ -- BWI Group's Electro-Mechanical Braking System (EMB) is poised to be the ultimate solution for brake-by-wire, making future intelligent mobility more trustworthy.

BWI Group’s latest EMB system architecture incorporates a comprehensive redundant hardware solution, encompassing dual redundant controllers, dual redundant power supplies, fully redundant sensors, and wheel-end actuators. This ensures the system attains the highest automotive safety integrity level, surpassing current failover redundancy requirements, thus enabling high-level autonomous driving capabilities.

BWI Group and ThyssenKrupp, building upon their six-year accumulation of EMB pre-development research, have implemented a dual-motor design for their EMB system. This design offers both greater clamping force and mutual safety backup between the two motors, ensuring sufficient redundancy. It not only fulfills the stringent high-safety redundancy requirements for SAE L-4 autonomous driving technology, but also lays a robust foundation for achieving even higher levels of autonomous driving advancements.

In the design of the safety redundancy system, the redundant power supply and communication systems constitute a fundamental safeguard for the entire system. Upon a primary power outage, the backup power supply promptly activates to sustain adequate power for critical safety fallback procedures, preventing loss of vehicular control. The communication redundancy technology ensures reliable data transmission, facilitating seamless signal transition between

primary and backup communication channels, thereby guaranteeing real-time transmission and a secure information connection.

Redundancy design also plays a critical role in the upper-level control system to ensure continuous operation of the system and avoid potential risks and losses. The redundant ECUs operate on dual power supplies, effectively functioning as two "brains." The primary "brain" oversees all decision-making and control functions, while the standby "brain" remains vigilant, poised to activate and assume control instantaneously in case of need.

Brake redundancy technology ensures braking capability in emergency situations. It not only prevents dangerous situations caused by brake failure but also helps maintain vehicle stability and controllability.

The full redundancy hardware solution adopted in BWI Group’s EMB system architecture ensure the system is able to achieve ASIL D, the highest level of automotive safety integrity, which meets all current legal fault mode redundancy requirements.

BWI Group's revolutionary full-dry EMB uses electronic sensors and actuators to control braking, eliminating the need for any hydraulic transmission. Its response time is half that of the intelligent integrated brake-by-wire system (1-Box), significantly reducing braking distance.

The BWI Group’s EMB, through intelligent brake control, meets the complex requirements of autonomous vehicles in diverse traffic situations. The system can execute precise braking strategies to ensure smooth and safe braking and parking in various complex conditions. This capability is crucial for enhancing the safety performance and passenger comfort of autonomous vehicles.

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