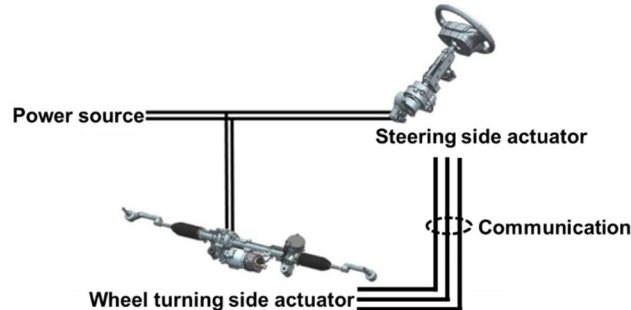


Hitachi Astemo develops Steer-by-Wire prototype with advanced steering and failsafe function



Steer-by-Wire with redundancy

Tokyo, September 30, 2022 – Hitachi Astemo, Ltd. (President & CEO: Brice Koch; henceforth, Hitachi Astemo) has developed a Steer-by-Wire prototype for vehicles, which actuates the tires not mechanically, but through the electric control of steering wheel inputs. The prototype not only realizes smooth, effortless steering wheel operation, but also redundancy through a fail-safe function that enables the continued operation in the event of a failure.

In anticipation of the evolution of autonomous driving, Hitachi Astemo and Hitachi, Ltd. are combining resources^{*1} to realize the practical application of a Steer-by-Wire that not only improves safety and comfort, but also realizes a greater degree of freedom in layout design, which is achieved by linking the steering system and wheel-turning system actuators using electrical signals.

^{*1} A device that converts power from motive force or driver operation into some kind of action.

Normally, the driver infers the road surface condition from the steering reaction force of the steering wheel and use that information in operating the vehicle. With Steer-by-Wire, Hitachi Astemo leverages the advanced steering feel technology developed through the former Showa Corporation's many years of extensive research. In addition, Hitachi Astemo and Hitachi, Ltd. Research & Development Group have jointly developed a function that conveys when the vehicle body has not turned during inputs of the steering wheel. Furthermore, Hitachi Astemo is leveraging industry-leading skidding control technology developed by former Hitachi Automotive Systems, which suppresses external interference from road surface irregularities, such as wheel tracks on snowy roads, to minimize the need for steering corrections by the driver.

To address the concern of Steer-by-Wire functionality in the event of failure, Hitachi

Astemo's prototype has a failsafe function, which adopts a two-system approach for the power source and wire harness that connect the actuator on the steering side and actuator on the wheel turning side; triples both the circuits in the steering wheel angle sensor in the steering side actuator and circuits in the wheel turning side actuator; and controls the braking force of the four wheel brakes while linking it to the vehicle steering function. This enables continued operation even in the event of failure or circuit loss, thereby enhancing safety.

Hitachi Astemo is committed to strengthening its business and delivering technological innovation through a strategic business portfolio, which consists of the Powertrain & Safety Systems business, Chassis business, Motorcycle business, Software business and Aftermarket business. Aiming for a better environment globally and growth around the pillars of "green," "digital," and "innovation," we will deliver highly efficient internal combustion engine systems; electric systems that reduce emissions; autonomous driving for improved safety and comfort; advanced driver assistance systems; and advanced chassis systems. Through such advanced mobility solutions, we will contribute to realizing a sustainable society and provide enhanced corporate value for our customers.

■Company Profile

Hitachi Astemo, Ltd.

Head Office: New Otemachi Building, Otemachi 2-chome, 2-1, Chiyoda-ku, Tokyo

Business: Development, manufacture, sales and service of machinery and equipment and systems for automotive parts and transportation and industrial use

For more information, please visit the Hitachi Astemo website:

(<https://www.hitachiastemo.com/en/>).

Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
