Innovative Vehicle Solutions

PRESS RELEASE

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Haldex presents open, scalable brake solutions for autonomous and electrical commercial vehicles

With the motto "Driving our Future", Haldex will present key concepts of the future at IAA Commercial Vehicles trade fair but also proven products and innovations.

With the development of autonomous driving, the vehicle system architecture is about to be re-written. Today, the driver does the integration of propulsion, braking and steering. To reach full autonomy, the subsystems need to control accurately and communicate back, for the system to be able to analyze the data and make correct decisions. System integration is thus the key for autonomous driving to become successful.

"System integration requires open communication. Today, only selected data of the wheel end performance is shared in the system, even though most of a vehicle's behavior is determined by the wheel end performance. Haldex wants to change that. We fully believe in open systems where the OEM gets full access to the data from the wheel end.", says Andreas Jähnke, SVP R&D at Haldex. "By developing the brake systems jointly with OEMs, we re-shape the principles for the vehicle system architecture. We know that new and old technology will live side by side for many years. By separating the software from the hardware, you can use the same software functionality to execute different mechanical tasks, hence you can have a vehicle structure which can run both pneumatic and electromechanical brakes. We also want to move away from the principle of the EBS being a black box that is the central hub for the intelligence in the brake system. To build a scalable system with maximum control and predictability, more technology and intelligence should be placed at the wheel end."

One of the new products from Haldex that is based on this concept is the **Fast Acting Brake Valve** (FABV). It's a high-performance valve, placed at the wheel end together with an ECU, that acts ten

times as fast as conventional modular based systems. The result is 15% less stopping distance, but also the ability to control the lateral and longitudinal friction levels on each wheel. With the FABV the vehicle runs in the path it intended to, with a stability and predictability you don't' see with other technology that is available today. Andreas Jähnke comments: "When replacing the driver, you need redundancy on different levels. We are not unique to provide steering by braking, but our wheel end accuracy with the FABV is unique."

Another product in development that also provides 15% improvement of the stopping distance, compared to air disc brakes, is the **Electromechanical disc brake** from Haldex. It's currently being tested on electric buses with positive results. The benefit of the electromechanical brake is not only its improved performance compared to today's air disc brakes, but the energy gains you get when you can replace the pneumatic brake system with a full electrical brake system.

Today's electrical heavy vehicles still has a pneumatic brake system installed. It needs about 2.5 times more energy than an electrical brake system. It's requires a compressor and other brake system parts you can remove from an electronic brake system. Åke Bengtsson, President & CEO for Haldex comments: "With our patent on electromechanical disc brakes and on-going vehicle tests, we are confident that we are a world leader on electromechanical brakes for heavy vehicles."

In Hannover, Haldex will provide more information on the actual state of these new developments, which are highly awaited on the market.

In the Haldex booth, Hall 26, stand C03, Haldex will be showcasing a cross-section of products. The new generation of the spring brake actuator **LifeSeal+** will be premiered at IAA. Listening intently to its customers, Haldex has developed the brand-new double diaphragm spring brake actuator LifeSeal+ for air disc brakes, which is primarily intended for use in semi-trailers in long-haul transport throughout Europe. However, its robust design also makes LifeSeal+ suitable for the hard conditions for tippers on construction sites.

Haldex is presenting the LifeSeal+ actuator at IAA together with air disc brakes from the **ModulT** range. Visitors can get a detailed look at the 19.5- and 22.5-inch versions for trailers, trucks and buses. Once again, Haldex will spotlight the success of the entire ModulT range: Approximately two million brakes have been produced since the range was launched in 2010. ModulT products, now as then, are light yet high-performing due to their characteristic single-tappet mechanism and lean construction.

There will also be other proven products from Haldex on display in Hanover such as the **S-ABA** automatic brake adjusters, universal **ABS or the EB+** electronic braking system with tire pressure control and ramp approach aid, and the new webshop.

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About Haldex

With more than 100 years of intensely focused innovation, Haldex holds unrivalled expertise in brake systems and air suspension systems for heavy trucks, trailers and buses. We live and breathe our business delivering robust, technically superior solutions born from deep insight into our customers' reality. By concentrating on our core competencies and following our strengths and passions, we combine both the operating speed and flexibility required by the market. Collaborative innovation is not only the essence of our products – it is also our philosophy. Our 2,200 employees, spread on four continents, are constantly challenging the conventional and strive to ensure that the products we deliver create unique value for our customers and all end-users. We are listed on the Nasdaq Stockholm Stock Exchange and have net sales of approximately 4.5 billion SEK.