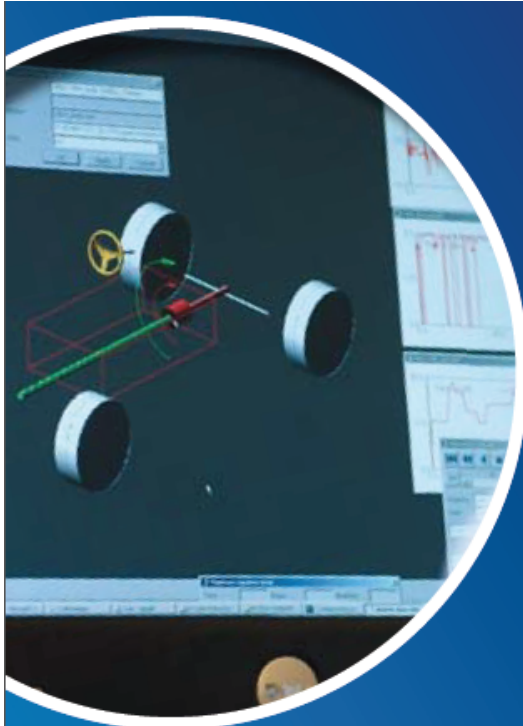




LANDSKRONA, SWEDEN [55° 52' N 12° 50' E]

CONNECTS





TEXT: Martin Neander · PICTURES: Magnus Torle



As a manufacturer of innovative controllable All-Wheel Drive (AWD) solutions, Haldex Traction Systems supplies some of the most prominent car manufacturers worldwide. With its globally leading technology, this Swedish company is an unparalleled success story.

"The fact that our AWD systems are controllable means that they can much better interact with other subsystems in the vehicle. The system software can be customized to meet each automobile maker's particular wishes in terms of driving characteristics and traction." In just a few words Ingvar Nilsson, Vice President Purchasing at Haldex Traction Systems Division, describes what counts in controllable systems for all-wheel drives. Volkswagen was one of the first major car manufacturers to install the Haldex AWD system in its vehicles in the nineties. Today, customers include Volvo, Ford, Land Rover, Audi, Seat, Skoda and Bugatti. Haldex' systems are used in a wide variety of passenger cars, in particular in SUVs (Sports Utility Vehicles) and in CUVs (Crossover Utility Vehicles). Haldex AWD systems are used, for example, in all Volvo all-wheel drive models, and the Volvo XC-70 is one example of a vehicle in this category.

Even famous English soccer player David Beckham has had the chance to enjoy the Haldex know-how. Two years ago, he ordered a Bugatti priced at 750,000 British pounds, of which only 50 will be made each year at the Bugatti factory in France. This super-fast car accelerates from 0 to 300 km/h in less than 14 seconds, in part due to perfect traction from the Haldex AWD system.

Sweden's industrial tradition Haldex Traction Systems is part of the Haldex Group, based in Sweden. While Haldex Traction Systems beginnings date back only ten years, vintage products showcased in the reception area at the company headquarters document that there is a long tradition of automotive-related activities. For instance, eye-catching and good old-fashioned mechanical as well as electronic taximeters, rally computers and gram gauges are on display.

The Haldex Group was formed in 1985 through the consolidation of three Swedish vehicle industry subcontractors: Garphyttan, which produced as early as the 1920s, Hesselman, dating back to the thirties, and Haldex, founded in the sixties. Today, the group offers proprietary and innovative technology solutions and is a successful niche player in the worldwide automotive market. The company has specialized in products for the automotive industry that enhance safety, environment and vehicle dynamics.

Haldex has four business areas: Commercial Vehicle Systems, Hydraulic Systems, Garphyttan Wire, and Traction Systems. Within the Haldex Group, Haldex Traction AB is responsible for the manufacture and worldwide marketing of the advanced flexible All-Wheel Drive (AWD) systems designed and developed by Haldex.

Top left: Haldex headquarters in Landskrona, Sweden.

Top right: The new Cross-Wheel Drive system is due to be launched shortly.

Bottom left: HOERBIGER transmission friction plates for Haldex AWD systems.

Bottom right: Transmission components for the Land Rover Freelander.

The Traction Systems Division is located in the city of Landskrona, at the southern tip of Sweden. The city has a long industrial tradition. Aviation pioneer Enoch Thulin settled here at the beginning of the twentieth century thanks to the flourishing aviation industry. Thulin's efforts laid the foundation for the company Thulinverken, which began manufacturing automobiles in 1920. Nilsson says that even without having a direct link to these earlier days, Haldex Traction Systems builds on the proud traditions of this city: **"We have 230 employees for product development, production and marketing in Landskrona. In Detroit in the U.S., we have an engineering office to support our U.S. customers. The primary production takes place in Sweden, with preassembly and low-volume production, including spare parts, conducted in Szentlőrincskáta in Hungary."** A new production plant in Mexico will enable a long-term increase in market share in the U.S.. The plant will be ready for production in the fall of 2007 with a planned production capacity of 200,000 units per year.

Innovative Solutions Innovative solutions are also attractive for the racing industry: In 2006, the renowned 24-hour Nürburgring race included an Audi team, sponsored by Haldex. The race car was equipped with a Haldex standard coupling linked for the race with specially developed software. The Audi team previously thought that AWD would not be suitable for such special racing applications. However, in 2005, the experts of Audi and Haldex joined forces because a race car with a more rear-wheel drive feel and therefore less understeer was desired. In the end, Haldex came up with a new solution for the AWD system.

"I believe that the key of our success lies mainly in that our employees bring their work in line with our customer's interests. They are well aware that the added value that we create for the customer also results in added value for Haldex," Ingvar Nilsson says. **"We encourage the individual employee to communicate openly and take active responsibility. We have noticed that encouraging personal initiative leads to professional growth and advancement."** Ingvar Nilsson points out: "Haldex's most important competitive advantages arguably are the high controllability and reliability of the systems. Another aspect is its highly developed expertise in vehicle dynamics, and with this the ability to give a car the driving characteristics that the customer desires."

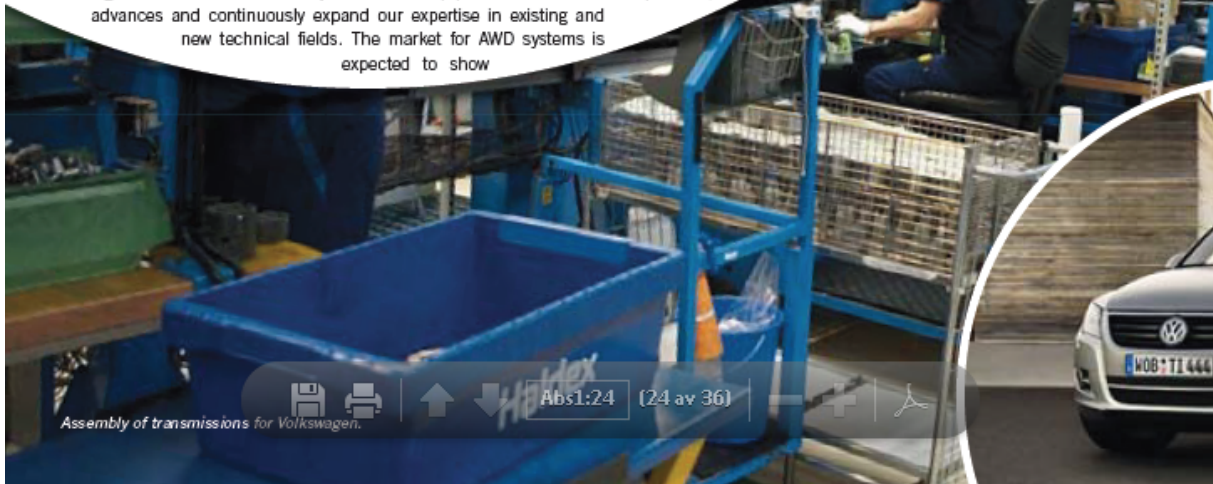
Research and Growth Extensive research and development efforts are behind this highly developed competence. To be able to meet customer requirements with competitive technical solutions, several research projects are being conducted in collaboration with technical colleges and universities. The objective is to keep pace with technical advances and continuously expand our expertise in existing and new technical fields. The market for AWD systems is expected to show

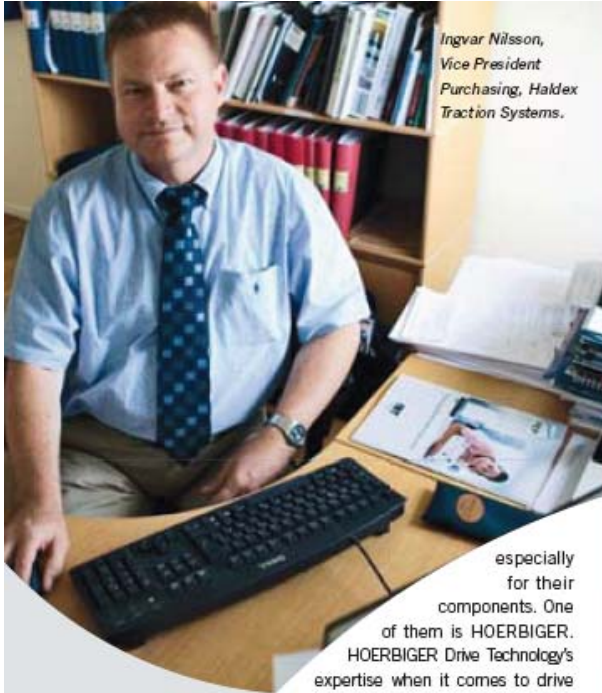
continued growth over the next few years. An increasing number of vehicles are offered with all-wheel drive. The VW Tiguan is one example in the Crossover segment.

The trend to replace simple systems with electronically controllable systems also contributes to the positive market development. Furthermore, legislation has been proposed in the U.S. aimed at preventing accidents resulting from unstable driving situation. If the legislation is passed, it will most likely boost the demand for controllable AWD systems in North America. **"The demand is certainly partly spurred by increased vehicle production worldwide"**, comments Nilsson. **"A large part of the increase is based on the growing demand for technology that promises improved safety, greater protection of the environment, and better vehicle dynamics. For this reason, Haldex is expanding its global presence."** The third version of the AWD system was developed last year for series production for the Land Rover Freelander. A new, fourth generation of all-wheel drive systems will be launched during 2007 and – as indicated by Nilsson - will include further technological innovations.

A technical solution that is also being launched is the new Cross-Wheel Drive (XWD) system. It allows a much safer ride, particularly during abrupt steering and evasion manoeuvres. XWD is enabled through software controlling and an electronically controlled differential in the rear axle. **"In order to broaden the product portfolio, we have developed a system with an adjustable differential lock,"** Nilsson explains. **"The aim is to further improve the vehicle's traction at lower speeds and to improve its handling characteristics at higher speeds, thus improving safety, comfort and driving pleasure."** Haldex received the first order for the XWD system in 2006, which will be supplied to a worldwide OEM in early 2008. And one more innovation: For even better vehicle dynamics, safety and manoeuvrability in demanding driving conditions, Haldex in 2006, together with a customer, began the development of a new Dual Torque Drive system.

Friction Discs from Germany Haldex is among the Tier 1 automobile industry suppliers. Car manufacturers rely on strong partners,





Ingvar Nilsson,
Vice President
Purchasing, Haldex
Traction Systems.



especially for their components. One of them is HOERBIGER. HOERBIGER Drive Technology's expertise when it comes to drive trains and gear boxes is extremely important for Haldex, especially when it comes to components used in clutch and brake applications. "We supply Haldex with components for its AWD systems," explains Michael Eisenschmid, Key Account Manager of the HOERBIGER Drive Technology sales team. "For example, HOERBIGER friction discs are used in the clutch systems."

Developing these components requires numerous test series using state-of-the-art laboratory technology: "Haldex places very high demands on the components. It is crucial to us that we can deliver parts that have high heat resistance and are not subject to wear during their lifetime. Also, they must not generate any kind of disturbing noise," Eisenschmid explains. Ingvar Nilsson, Vice President Purchasing at Haldex Traction Systems, also points out the important role of the suppliers: "We are very happy with HOERBIGER as a supplier," he says. "HOERBIGER provides great quality products and also has a very good understanding of the conditions of our industry. This was the reason that today HOERBIGER is our only supplier of sintered friction discs."



The Crossover segment is a growth market. One example is the new VW Tiguan.



PART

The all-wheel drive sector's demands on the components are high: high shifting comfort, minimized noise emissions, extremely low wear and support throughout the entire life cycle of a vehicle. HOERBIGER Drive Technology meets these challenges with highly advanced know-how in the areas of tribology and metal forming technology. Special steel and lining disks with carbon or sinter friction linings as well as unique materials allow maximum driving comfort.

www.hoerbiger.com

WebLink: AWD-Systems

PARTNERSHIP

HOERBIGER Drive Technology is the global partner of the automotive industry. HOERBIGER supplies components and systems for transmissions in passenger cars, trucks and offroad vehicles and is the worldwide market leader in complete synchronizers. The product portfolio also includes plates and clutches, electrohydraulic control systems for powertrains as well as system solutions for transmissions, brakes and axles.

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PARTNERSHIP

On May 23, 2007, Ulf Ahlén, Managing Director of Haldex Traction AB, received the ten millionth sinter disc from HOERBIGER. This is a milestone in the long-term partnership between the two companies, whose collaboration began in the mid-1990s, followed in 1998 by the first production order for Volkswagen.

www.haldex.com