

Haldex offers proprietary vehicle technology solutions to the global vehicle industry within specific niches. We focus on products to improve safety, the environment and vehicle dynamics.

We are enhancing our competitive capabilities and building long-term customer relationships through high performance, low total costs to the customer through the product's service life, ethical business practices and commitment to long-term partnerships. Haldex operations are divided into four business areas: Commercial Vehicle Systems, Hydraulic Systems, Garphyttan Wire and Traction Systems.

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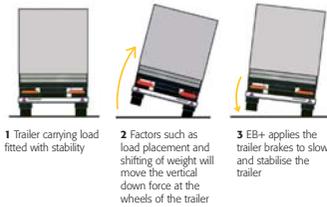
ELECTRONIC BRAKE SYSTEMS



Roll Stability Control for Trailers

The trailer roll stability system is designed to intervene if it detects a risk of rollover. The system constantly monitors the trailer's movements and speed through an onboard accelerometer and wheel speed sensors, and when needed sends instant commands via the EBS unit to control the braking and assists in reducing the potential of the trailer from rolling over.

Haldex EB+ Generation 2 assembly has built in stability control for the trailer as a recommended option. Usually the driver is unaware of the trailer instability due to a number of varying conditions, and as the event normally begins at the trailer it is sometimes too late for the driver to intervene and take control over the rollover. This makes it important to have stability



$$\text{Stability Formula} = (v^2/r).h < g.t$$



control on the trailer rather than just the tractor as the system works independently of the driver applying the brakes dependant on the system inputs.

The EB+ unit has technology that can calculate the point at which the trailer is at a potential rollover and automatically slows the speed of the vehicle by applying individual brakes without the need of driver

intervention. When the critical threshold values are reached the system will intervene.

A stability system is a cost effective saving for the fleet owners by reducing the potential of rollover accidents and adding an enhanced safety feature to their fleet.



CUSTOMISED FEATURES

Super Aux

Super Aux is a second power supply and allows multiple trigger signal inputs for the EB+ Generation 2 assembly.

The first Haldex EB+ system offers a dedicated secondary power supply port. This Power B port uses the power source from the stop lights as almost all drivers connect at least the light system of the truck and trailer before driving. This ensures that the 'Electronic Load Sensing' and 'ABS' functionalities are still available even if the ISO 7638 power supply may fail or is not used at all. This option offers a big advantage in safety.

The Super Aux connection was specifically developed as there are a number of applications where trigger signals from the truck and trailer are required.

Some examples of these applications are

- Traction Support with front lift axles
- Steer axle lock during reversing or on driver demand
- To switch on an 'Electric Brake Demand', e.g. for extra resistance in a road-laying combination
- Tipper "Quick Dump" if body is up

In the past prior to Super Aux it required extra work and cost to obtain these inputs in the system, because additional cables / relays were needed.

With Super Aux these additional trigger 'cores' are added to the "Power B – Super Aux" cable and reach EB+ without creating any extra installation work.

E.g. Super Aux = One cable (6core) a backup power + 3 Inputs + 24V Output (low current)

The significant point is that these three trigger inputs are not solely dedicated to a specific application, as they can be used and programmed very easily using DIAG+ to suit the application required. Logical operations and combinations are also possible.

For example: Steer axle lock

Input A could be connected to the 'reversing light'

Input B could be connected to a switch in the cab

Result: Steer axle is locked if the

- Truck is reversing or
- Driver activates his switch or
- Above a certain speed threshold is programmed

Therefore Super Aux offers even greater flexibility and options within the system and at the same time reducing overall costs.



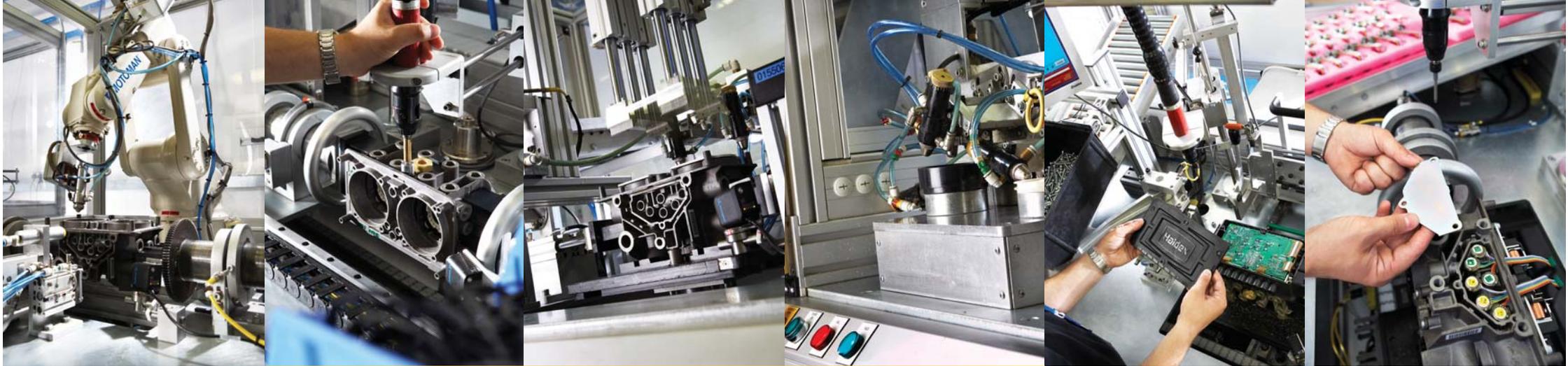
Product Development

EB+ Gen 2 is the next Generation of the EB+ product family, which is the accumulation of a 2 year intensive product development program. Using extensive market research and field experiences gained from the Generation 1 product, the Gen 2 platform has adopted feature integration as its hallmark, providing a simplified vehicle installation and a low cost of ownership. Haldex engineers have integrated a number of features whilst providing a very simple overall flexible construction.

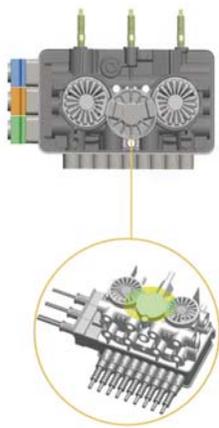
On the manufacturing side, significant investment has seen a new process line installed at the Haldex plant in Redditch which has been fully developed around lean manufacturing way philosophies.

The new multistage process line fully utilizes right from me and poke yoke principles whilst a full automated conveyor system ensures a levelled flow between multiple test and assembly stations. In addition, a single piece flow methodology has been fully adopted, reducing WIP, improving quality and supporting a lean manufacturing philosophy.

The process line will not only improve current right first time (RFT) figures, provide a high quality reliable product but increase the overall production capacities hence shortening lead times to customer.



MAIN FEATURES



QRV

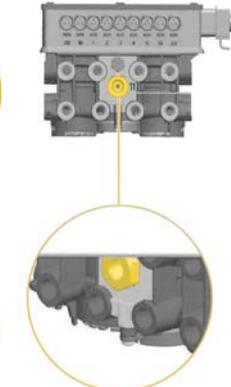
An integral quick release valve provides a rapid installation and reduces the need for separate pipe fittings and connections.

In addition the spring brake air, once exhausted, is silenced using the EB+ silencing mechanism.



Service Brake Test Points

The Gen 2 system provides two additional service brake ports, which can allow direct connections to the exterior test points.



DCV/ACV Distribution Manifold

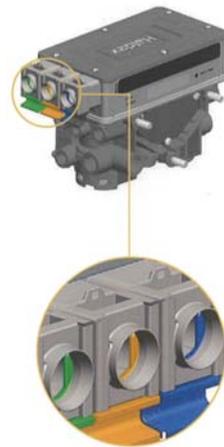
An integral anti-compounding spring brake distribution manifold eliminates the need for a secondary manifold and associated fittings, hence saving installation time and potential errors.



Bulk Head Mounting

Three stud mountings, provide interchangeability with competitor systems.

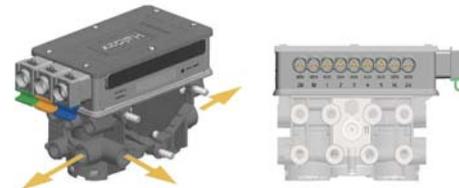
In addition, the mounting method allows much easier installation.



Individual Electrical Retention

The Gen 2 system utilises well-recognised EB+ connectors, and the slide lock mechanism has been improved to allow each connector to be removed and inserted individually.

This improves installation time and reliability.



Reservoir Connections

The Gen 2 system provides up to three reservoir connections, which allows complete installation flexibility for vehicle manufacturers.

This flexibility not only provides a rapid installation, but allows the reduction of pipe lengths.



Connection Alignment

The Gen 2 system has been deliberately designed to ensure ease of vehicle installation. All the ports and electrical connection positions have been chosen to provide easy identification and are aligned to allow brake pipes to be bundled together, thus providing an efficient cost effective, overall installation package.

ECU

The Gen 2 system provides a sealed for life encapsulated ECU, thus eliminating interconnections.



Specifications

ABS Configuration	2S/2M, 4S/2M, 4S/3M Annex XIV to EC Directive 98/12 Category A
Operating Voltage	Permanent 24 Volts DC nominal (conforming to ISO 7638) 19-32 voltage range
Current Consumption ECU	3.2 Amp maximum Flame retardant, fully encapsulated. Plastic enclosure. External connections via up to thirteen moulded plugs
EMC/RFI Approval	Directive 72/245/EEC as last amended
ABS Values	Haldex Modulators Integrated with electronic load sensing Control, Delivery and suspension M16 ports. Reservoir M22 ports
Operating Medium	Air
Operating Pressure	0-8.5 bar (9.1 bar maximum)
Operating Temperature	-40 C to +70 C
Brake Chambers	6xT30 Max
Exciter	80 to 120 Teeth
Diagnostics	Haldex Info Centre. PC End-of-Line Test via CAN interface
24 Volt Output - AUX 1,2,3	1.0 Amp maximum each output
5 Volt Output - AUX 4,5	0.025 Amp
24 Volt Output - Diag	1.0 Amp maximum
Permissible Tyre Sizes	Product default 306 rev/km (385/65R22.5) Range of -22% to +17.5%
Vehicle Brake System	Air
Vehicle Suspension System	Air and mechanical

Innovation
and experience
brought together
to create a
dynamic and
flexible system



A WORLD LEADER IN ELECTRONIC BRAKE SYSTEMS



Haldex continues to drive innovation as one of the world's leading manufacturer's of Trailer Electronic Braking Systems. This innovation, coupled with our vast knowledge and experience of trailer braking, has shown that our current EB+ system has many advantages over its competitors.

Our next generation EB+ product continues to build on this experience and with the valued input of some of Europe's leading trailer manufacturers we have captured that ingenuity and created a new and more dynamic and flexible system, with additional built in features to suit the needs of all trailer builders, fleets and end users.