Innovative Vehicle Technology
Haldex is a vehicle technology company.

We offer proprietary and innovative solutions to the global vehicle industry.

We focus on products that improve

- Safety
- Environment
- Vehicle dynamics.
Customers & Products

Heavy vehicles

Industrial vehicles

Engines

Cars

Brake-systems 59%

Hydraulic systems 17%

Spring wire 14%

AWD systems 10%
Global presence

- Annual sales ~ 7.5 BSEK (~ $1,000 m)
- 4,800 employees
- Production in North America, South America, Europe and Asia

Innovative Vehicle Technology
Brake Systems

Air Management
- Compressor
- Air dryer systems
- Air cleaner

Brake Control
- ABS
- EBS
- Valves
- Brake chamber

Air Suspension
- Height control
- Suspension control

Wheel Brake
- Brake adjusters (drum)
- Disc brake
- Brake linings

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Typical 3 axle Tractor with ABS
Power Systems

Lift systems
- Construction & Forklifts
- Truck tailgates & Axles
- Aerial work platforms

Other Power Systems
- Dump truck compaction
- Power steering
- Emergency brake & steer
- Commercial mowers & Ag equipment

Energy Management Systems
New technology under development
Engine Products

- Advanced wire products
- Fuel transfer pumps
- Cooling fan drive systems
- Crank case ventilation gas cleaning – Alfdex
- Fuel saving EGR systems - Varivent

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AWD Systems

Electronically controlled system

- Automatic & extremely fast
- Improved safety & traction
- Compatible with ESP/ABS
- Optimized vehicle dynamics

Generation III

Innovative Vehicle Technology
Business Conditions - Market Upturn

- Light vehicle growth ~ 3%
- 4WD penetration 18% ⇒ 23%
- 4WD CAGR ~ 6.5%
- Controllable 4WD CAGR ~ 20% in NA + EUR
- End of 2005 a slow down in sales of SUVs
- Medium and long-term growth pattern looks promising, increased usage of AWD on passenger cars and increased usage of crossovers.
Global Customer Base

**Truck & Bus**
- DAF, Daewoo, Dong Feng, FAW, Ford, Freightliner, Hino, Hyundai, Iveco, Kenworth, Kia, Mack, MAN, Telco, Mercedes, Navistar, RVI, Volvo, Peterbilt, Scania

**Axle & Trailer**
- BPW, Dana, Fruehauf, General Trailer, Great Dane, Kögel, ROR, SAF, SESR, SMB, Trailor, Utility, Wabash

**Cars**
- VW (Golf, Bora, Beetle Rsi, Sharan), Audi (Audi A3/S3, Audi TT), Skoda (Octavia), Seat (Leon, Alhambra), Volvo (S60, V70, S80, XC70, XC90), Ford Mercury, Bugatti Veyron, Land Rover

**Forklifts**
- Atlet, Toyota (BT, Raymond, Prime Mover), Jungheinrich, Linde, NACCO (Hyster, Yale), Rocla, Crown

**Construction**
- Bobcat, Caterpillar, Dana, Dynapac, Genie, Grove, Komatsu, O&K, Vögele Weyhausen, Volvo Construction Equipment

**Engines**
- Caterpillar, Cummins, DAF, Detroit Diesel, Mercedes, Scania, Volvo

**Springs**
- Associated, Matthew Warren/Automatic, Meritor Suspension Systems, Muhr & Bender, Peterson, Renault, Scherdel

**Tailgate/Bogie**
- Behrens, Bär, Dautel, Interlift, Ray Smith, Volvo Scania, Sorensen, Zepro

Innovative Vehicle Technology
## Competitors and Market Shares

<table>
<thead>
<tr>
<th>Category</th>
<th>Competitors</th>
<th>Haldex market shares</th>
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<tbody>
<tr>
<td>Brake Systems</td>
<td>Arvin Meritor, Knorr Bremse, Wabco</td>
<td>• Overall ~ 15%</td>
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<td>• By product 5 - 65%</td>
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<tr>
<td>AWD Systems</td>
<td>Borg Warner, GKN, Magna Drive Train</td>
<td>• All AWD types ~ 5%</td>
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<td></td>
<td>Torsen, Toyoda</td>
<td>• Controllable AWD ~ 35%</td>
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<tr>
<td>Power Systems</td>
<td>Bosch, Eaton, Parker Hannifin,</td>
<td>• Overall ~ 10%</td>
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<td>Sauer Danfoss</td>
<td>• By product 5 – 35%</td>
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<td>Engine wire Products</td>
<td>ASW, Kisswire, Suncall, Suzuki</td>
<td>• Overall ~ 30%</td>
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<td>• By product 20 – 35%</td>
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Innovative Vehicle Technology
Focus on profitability

- Strengthen positions on new markets
- Product development
  - Increase product range to heavy trucks
  - New generation AWD
  - New technology for diesel engines
- Joint ventures and acquisitions

- Increased production in low-cost countries
- World class production
- Reduced purchase costs
# Product development

## Rationalization

- Improve/maintain margins
  - ABS/EBS Trailers
  - ModulX disc brakes
  - Product line (DF) Actuators
  - ModulAir Air dryer products
  - Platform power systems
  - New suppliers of rod wire

## Upgrading

- Increased business
  - XWD and PreX
  - W100, 1200, Låg rpm pump
  - Elektric fuel insertion pump
  - Brake linings (Long-life)
  - Oteva 90 Valve spring wire
  - Nitratable piston ring
  - AWD Generation III

## New product

- New/increased business
  - ABS Trucks
  - Product line (P) Actuators
  - EBS Trailers, NA
  - Twin Disc brake
  - Energy Management Systems
  - Alfdex
  - Varivent
  - Oil-free compressor
  - Elektric disc brake

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**Innovative Vehicle Technology**
Challenge

That in a business with an annual growth of 2-3% find niches that have higher growth.
Haldex has grown:
• organically
• by mergers and acquisitions

Therefore a complex structure of
• organization
• ERP systems
• CAD systems
• PDM or Product definitions
Customer base:
- global
- different standards
- different CAD
- different requirements
- different ECM

Requires agreements on conversion Haldex data to their standards.
Communication:

• e-mail
• CD
• EDI
• Direct, e.g. VW