Competing in Turbulent Times—Insights from John Sanderson

John Sanderson, former president and CEO of Siemens VDO Americas, a $3.5 billion business with 11,000 employees, talked candidly with us recently about the state of our industry and what companies need to do to succeed.

Before it was acquired by Continental, Siemens VDO had been the fastest growing automotive electronics supplier on the planet, faster than Denso, faster than Hitachi Automotive, faster than Bosch. One of our industry’s leading lights, Mr. Sanderson began his automotive electronics career in 1982 with Bendix Electronics, which was acquired by Siemens in 1989.

Mr. Sanderson now sees an automotive electronics industry in turmoil, challenged by high commodity prices, the effects of global competition, the decline in the U.S. and European economies, and a shift in U.S. consumer preferences away from trucks and SUVs due to high oil prices. (Small, economical cars have less electronics content than trucks and SUVs.) As a result, the consolidation that has been underway in our industry for well over a decade is accelerating.

Winners

Despite all the difficulties, a number of companies will continue to excel, says Mr. Sanderson, “because they are characterized by strong, capable and deep management teams, they can adapt to different customer cultures across the globe, they can execute, they have compelling technical and operational advantages, and they have positioned themselves in growth segments.”

Among tier-one suppliers, those best positioned for success are Bosch, Denso, Hitachi Automotive, faster than Bosch.

Top Ten Automotive Electronics Industry Trends

1. Electronics Content Leveling
   According to some carmakers, the percentage of the average, non-hybrid vehicle’s cost devoted to electrical and electronics parts and software is no longer increasing—it is likely to remain at 20% to 25%. As a result, the global market for such parts can increase only as a function of the growth in the number of vehicles produced each year plus increases in the average light vehicle retail price, assuming those price increases translate into larger budgets for electrical and electronics parts. But the growth in E/E content will also be held in check by rising raw material costs for non-electronic parts and by the appeal of tiny, super-economical vehicles like the $2,500 Nano from the Indian carmaker Tata Motors. We identified this extremely important development and began writing about it two years ago.

2. Software Key to Competitive Automotive Advantage
   Software, the single most important ingredient in automotive systems, is mushrooming. In the engine controller alone, software content doubles every year. As such, carmakers and suppliers with the best architectures and the best integrated software development tool chains are likely to gain competitive advantage. Companies that get software development right will bring new and improved features and functions to market more quickly, with fewer engineers, and they will keep their warranty costs low.

3. Autosar’s Impact
   While most of the world’s carmakers are taking steps to adopt Autosar, it will take at least a decade for the standard to be implemented in enough vehicles to significantly impact the global market.

But of all the technical standards thus far adopted by the automotive electronics industry, none will have as much impact as Autosar. The software architecture standard will significantly lower the cost of systems and improve their quality.

Autosar lets carmakers reuse proven software in multiple platforms and in multiple vehicles. Software that fits one application won’t need to be reengineered and customized each time it is used in a new application, and that will save a great deal of development time and money. The basic Autosar software that underpins every system will be commoditized, as will some of the electronics hardware including the microcontroller that runs the system. With Autosar, software will be sold separately from hardware.

4. Open Source Linux Platform Will Take a Big Bite Out of Infotainment Market
   BMW’s initiative with Intel, Wind River and others to create a standard open-source infotainment platform based on the Linux operating system will permanently alter the market. What is driving the Linux infotainment initiative is the same as what’s driving Autosar: the opportunity to significantly reduce the cost and improve the quality of software. Instead of relying on vertically integrated suppliers to handle the entire customized infotainment system, carmakers and system integrators will be able to purchase best in class software components from a variety of sources, whose applications are designed to fit the standard platform. The standard platform itself, which will include much of what’s common to infotainment systems, will become a commodity.

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Turbochargers—More Electric Actuation

Turbochargers have been around for a very long time, but over the last several years, because of their role in improving fuel efficiency and limiting CO2 output, demand for them has been increasing and will continue to increase. According to Alex Ismail, president of passenger vehicles at Honeywell Turbo Technologies, turbochargers will be used in 35% of all passenger vehicles in 2013, up significantly from 24% in 2007. “What is driving this industry is the drive for fuel efficiency and emissions compliance, CO2 reduction. For the last 20 years our customers have had no better solution than downsizing. Whether you talk about diesel engines or gas engines, smaller is still better,” he said.

Turbochargers use the exhaust gases to power a turbine that drives a compressor that is mounted on the same shaft. The compressor delivers outside air to the cylinders at elevated pressure and thereby boosts the amount of fuel that can be burned, increasing the engine’s power output. As a result, the engine can be smaller, lighter and/or have fewer cylinders and lower friction losses—without sacrificing performance. Further efficiencies are gained by converting the energy in the exhaust gas into compressed air that feeds combustion.

Compared with a naturally aspirated engine, a downsized engine with turbocharger can potentially reduce fuel consumption and CO2 emissions by 15%, suggested Tom Grissom, director of business development for BorgWarner’s turbo and emissions systems business. “When you are on a flat, level road at 50 mph, you need only a small fraction of the total power capability of the engine. So under those conditions you don’t want any boost at all, and you want to be running with the smallest physical displacement engine you can get. That is where a 1.8-liter engine that makes the same rated horsepower as the 4-liter engine gives you tremendous fuel savings.”

According to Continental, growth in turbocharger demand will be particularly strong in North America, growing from 1.0 million units in 2007 to 2.3 million units by 2013. And growth will be strong in Europe, where carmakers are increasingly using turbochargers on gasoline engines. In 2007, 1.6 million gasoline engines in Europe came with turbochargers; by 2013 that number will climb to 3.8 million units. Continental is developing a turbocharger for gasoline engines. “One hundred percent of diesel engines are turbocharged, compared with 10% to 20% of gasoline engines,” noted BorgWarner’s Mr. Grissom, adding, “The demand for turbocharged gasoline engines will go from about 2 million units in 2008 to about 4.5 million units by 2012.”

More Accurate Control with Electronics

Increasingly, turbochargers are being fitted with electronics and electrical parts. Today 50% of Honeywell’s turbochargers come with an electric actuator. The actuators use a solenoid or a DC motor to control the turbocharger’s wastegate mechanism, or in variable geometry turbochargers, typically used for diesel engines, to control the position of a vane. The vane controls the flow of exhaust gases impinging on the turbine. “The vane is like putting your finger on a water hose to accelerate the flow,” explained Honeywell’s Mr. Ismail. “In five to ten years 70% to 80% of all the turbochargers we make will have electric actuation.” Electric actuation provides more accurate control over a wider range of operating conditions.

While not widely applied today, the addition of turbine speed sensors and temperature sensors is on the increase. It should be pointed out that adding electrical parts to turbochargers is a huge packaging challenge. Gasoline turbochargers have inlet temperatures up to 1,050 degrees Celsius.

Another application of electrical parts to turbochargers is e-boosting, which complements the exhaust-gas-powered turbine with auxiliary power provided by an electric motor. E-boosting uses a high-speed electrical motor to drive the turbocharger up to speed before exhaust gases are available, for example when the vehicle is at idle, thereby providing faster engine acceleration. According to Honeywell, the addition of a 700-watt motor to a 1.3-liter gasoline engine improves the turbine’s transient response by 50%.

Honeywell, working on e-boosting R&D with at least one of its customers, sees the technology as a perfect fit for hybrids, which could use the power from regenerative brakes to power e-boost. With only a 12-volt battery available in today’s non-hybrid vehicles, the e-boost motor’s power would be limited, which would shorten its duty cycle. The technology will take at least another five to 10 years to develop.

According to Automotive News, Eaton is developing electrically driven superchargers for fuel cell vehicles. Superchargers commonly refer to turbochargers that are powered, not by exhaust gases, but mechanically by the engine, or electrically.

Turbo Market Getting More Crowded

Honeywell, the world’s number-one turbocharger supplier, produced more
5. Fuel Economy Trumps Safety

With more than one million people killed each year on the world’s highways, the development of advanced active safety systems has received a lot of attention and a fair amount of investment. Autonomous systems which automatically steer or brake the vehicle to avoid accidents are especially promising, as are driver monitoring systems. However, with the soaring price of oil and tough mandates to curb CO2 emissions on the way, fuel efficiency has become the global industry’s development obsession. Gartner, Inc. predicts that by 2012, implementations of fuel-saving, emissions-reducing “green” technology will account for 50% of the projected $6.3 billion global market for automotive microcontrollers.

6. Hybrids a Strong Growth Segment

The number of full hybrid vehicles produced globally will surpass one million units per year by 2010, growing quickly from there. J.D. Power and Associates predicts that hybrids will account for 7% of the car market in 2015, compared with 2.2% in 2007. Full hybrid vehicles require significantly more electronics content than non-hybrid vehicles. For example, a hybrid today requires roughly $700 worth of semiconductors, compared with $300 worth for a non-hybrid. For the next few years, however, the vast majority of hybrid vehicles will be built by Toyota and Honda, who are not at all open to doing business with Western suppliers unless it is for parts they cannot source from their affiliated Japanese partners.

7. Auto Electronics Industry’s Center of Gravity Has Shifted Away from Detroit Toward Munich and Toyota City

The financial struggles of GM, Ford and Chrysler have made those carmakers far less aggressive about new technology and not very proactive about creating new industry standards. German carmakers, led by BMW, have become the main drivers of a lot of new automotive electronics, especially software, networking, infotainment and chassis control technology.

Meanwhile, Japanese carmakers make most of the world’s most reliable cars, an attribute that helped to make Toyota the world’s number-one selling carmaker. Jaspar, the Japanese automotive electronics consortium led by Toyota, holds veto power on what standards the Japanese carmakers buy into and what those standards look like.

8. China

The world’s second-largest auto market, light vehicle sales in China are expected to top 9 million units this year, according to Automotive News, and to grow by over 10% per year through 2012. In comparison, the global market has been growing by only about 4% per year. China has for years been attracting automotive electronics suppliers from North America, Europe and Japan and is emerging as the world’s most competitive arena for automotive electronics. Carmakers and suppliers alike have moved beyond manufacturing joint ventures to establish world class engineering and R&D facilities. From this Chinese crucible, powerful new companies will rise up to take on the world.

9. A Time for Specialists

Companies that focus on what they are very good at can thrive despite these difficult times. That has been the case for software outsourcing companies like KPIT Cummins, for software tool makers like Vector Informatik and for contract manufacturers like Elektronics. Elektronics’ automotive revenue, excluding recent acquisitions, will grow 27% from fiscal 2008 to 2009, according to the company.

10. Delphi on the Ropes, a Boon to the Competition

With North American light vehicle sales down 20% this year and the credit markets tighter, Delphi’s ability to emerge from the bankruptcy proceedings it began in October 2005 is becoming more uncertain. Even if it is able to stay clear of liquidation by renewing its bankruptcy financing, which expires at year end, General Motors is so worried about Delphi’s financial problems that it increasingly wants to avoid booking business with them, directing it instead to suppliers with healthier balance sheets.

According to one top electrical engineer at GM, the carmaker is wary about doing business with Delphi, even in areas where Delphi shows strong technical competence, for example in audio and infotainment products, data communications, architecture development and wiring. Among the companies likely to benefit from Delphi’s troubles are Harman Becker, Continental, Alpine and Bosch. Our GM source noted that “while Bosch is a strong company with a good history, their pricing is sometimes not as good as everybody else.”

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Turbocharger Suppliers

Ranked by Sales

1. Honeywell
2. BorgWarner
3. IHI Charging Systems
4. Mitsubishi Heavy Industries

Future Suppliers

Bosch Mahle Turbo Systems 2011
Continental 2011
Daimler JV with IHI 2011
Hitachi 2010
The Company Profile... Johnson Electric Group

**Headquarters:** 12 Science Park East Avenue, 6/F, Hong Kong Science Park, Shatin, New Territories, Hong Kong; Phone: 852 2663 6688; Fax: 852 2897 2054; www.johnsonelectric.com

**Products:** Motors, actuators, switches and sensors

**FY 2008 Sales:** $2,221 million
**Capital Expense:** 4.5%
**EBITDA Margin:** 12.6%
**Operating Profit Margin:** 8.5%
**Cash Flow from Operations:** $315.9 million

**Working Capital:** $592 million as of March 31, 2008
**Net Debt:** $298 million as of March 31, 2008
**Total Equity:** $1,133 million as of March 31, 2008
**Market Capitalization:** $1,770 million as of August 19, 2008

**Employees and Subcontract Workers:** 40,441

**Sales per Employee:** $54,920
**FY 2008 Automotive Sales:** $1,157 million
**Automotive Products:** DC and stepper motors, motor-based actuation systems
**Top Automotive Customers:** #1 Ford, #2 Behr, #3 Delphi

**Ownership:** Mrs. Yik-Chun Koo Wang, 91-year-old co-founder of Johnson Electric, 58.9% of shares; HSBC International Trustee Ltd. 26.1%; Anscher (Bahamas) Ltd, 24.2%

*Note: FY 2008 ended March 31, 2008.

**Background**

Johnson Electric was founded in 1959 by Mr. Wang Seng Liang and Mrs. Yik-Chun Koo Wang to produce micromotors. The company has been producing micromotors for the auto industry since 1976. In the last decade Johnson Electric expanded its manufacturing from two factories in Asia to more than thirty plants located in 14 countries. Johnson Electric today employs more than 40,000 permanent and contract workers in 20 countries, with 90% of the workforce engaged in production activities in China.

Since 1984 Johnson Electric's sales have grown annually at the rate of 18.4%.

The company's balance sheet is solid. Current assets exceed current liabilities by $592 million.

Johnson Electric has been listed on the Hong Kong Stock Exchange since 1984. It has a sponsored American Depository Receipt program in the United States through JPMorgan Chase Bank. Johnson Electric's principal financial objective is to maximize long term cash flow.

Direct current motors and stepper motors are at the root of everything that Johnson Electric makes. They can be sold separately as components or packaged with other components into motor-powered subassemblies such as Gate cooling fan modules, or so-called motion-subsystems such as Saia-Burgess HVAC flap actuators. More than half of automotive sales comes from cooling fan modules and flap actuators. Automotive applications account for half of all sales.

Johnson Electric is not overly dependent on any one customer, even its largest: Ford, Behr and Delphi. The company says each of its major customers typically accounts for up to $50 million worth of business annually.

The market for automotive motors is increasing at the rate of about 7% per year in unit volume, depending on the region where the vehicles are sold. “The BRIC countries [Brazil, Russia, India and China] are following the same trend as Europe and the States, where cars start out basic, without all the doodads and features, and over time add conveniences like power...
The Company Profile Continued

**Johnson Electric Automotive Sales by Product**

FY 2008 Total Automotive Sales: $1,157 million

- Motion and Actuation Systems, 29.9%
- Chassis braking, 3.6%
- Powertrain management, 5.8%
- Body climate, 9.1%
- Body instruments, 14.8%
- Powertrain cooling, 37.0%
- Motors, 70.1%

**Johnson Electric (Estimated) Automotive Sales by Motor Type**

FY 2008 Total Automotive Sales: $1,157 million

- Brushless DC, 10%
- Stepper, 20%
- Brushed DC, 70%

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**Distinctions Claimed by Johnson Electric**

- Profitable every year since 1984
- Three million motors and actuators manufactured per day
- Fifteen million switches produced per month
- Gate cooling-fan modules are #2 in the world, #1 in Europe and #1 in China.
- Annual production capacity of more than one billion motors and motion sub-systems
- In 2002 Johnson Electric’s LIN bus actuator for HVAC flap regulation became the first mass-produced LIN application in the world.

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**Johnson Electric’s Top Automotive Customers**

- #1 Ford
- #2 Behr
- #3 Delphi
- Others, alphabetically:
  - CRH (formerly Hammerstein) Peugeot
  - Delphi Valeo
  - Lear Visteon
  - Magna

**Johnson Electric Holdings Five-Year Stock Price History (in Hong Kong dollars)**

[Graph showing stock price history]

**Data: Reuters**

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window lifts and door locks, seat movement and air conditioning,” noted James Dick, senior vice president of sales and strategic marketing. Mr. Dick joined the company in 1999.

The market for motors in Europe is not growing as quickly as it was five years ago. Then, “you only had 50% of cars equipped with air-conditioning units, but today you have 95% penetration,” said Marc-Olivier Lorenz, senior vice president for the Automotive Products Group, Europe and the Americas. On average, mid-level vehicles have as many as 50 motors each; luxury vehicles can have as many as 150 motors.

Johnson Electric’s main competitors in automotive motors are Bosch, Continental and Mabuchi Motor.

**Emphasizing Automotive Brands**

Under its umbrella corporate brand, Johnson Electric, the company is supporting three powerful automotive brands that cover its full range of products: Gate, for cooling-fan modules; Saia-Burgess, for actuators and switches; and Johnson Motor, which applies to the motors that Johnson Electric has always been known for.

In 1999, when Johnson Electric purchased the Electric Motor Systems business from Lear Corporation, it decided to maintain the Gate brand because Gate was the European market leader in cooling-fan modules. This decision helped the company carve out a strong position for Gate products in North America and Asia. Gate has the largest market share in the fast growing Chinese market as well.

Implementing its strategy to add more value to motors by moving into motor-based actuators, Johnson Electric purchased Saia-Burgess in 2005. Saia-Burgess is a leading supplier of flap actuators (the motor and electronics assemblies that control airflow in automotive HVAC systems) and headlamp actuators.

“Once we acquired these other companies, we created the Johnson Motor brand to cover our DC motors for automotive applications. Customers had been referring to us as ‘Johnson Motor’ for many years anyway,” noted Mr. Dick.

**Johnson Motor**

Johnson Electric specializes in DC motors with a power range from about one watt to 1,000 watts. The smallest motors measure just 6 millimeters in diameter and are used to load and eject CDs and DVDs or to power mirror adjustors. The largest motors are used for engine cooling. “One of our big advantages is that we produce all types of DC motors, so we can offer whatever is best for the application, whether it’s a stepper motor, a brushed motor or brushless motor,” noted Mr. Lorenz. Brushless motors are more efficient than brushed motors, handling commutation (to reverse current direction as the rotor rotates) electronically; brushed motors use mechanical commutation. Stepper motors rotate in short angular movements rather than continuously. All three types use electromagnetism to generate motion.

Johnson Electric doesn’t make the sort of stepper motors that power instrument cluster gauges. It has just begun to explore some high temperature DC-motor applications for the engine compartment.

Johnson Electric motors cost anywhere from $0.50 to as much as $80 for a very high-end brushless motor.

**Gate Cooling-Fan Modules**

Already Johnson Electric’s biggest selling automotive product, Gate cooling-fan module sales grew by 22.1% in FY 2008, although much of that increase was due to a favorable euro exchange rate against the U.S. dollar. Excluding this effect, the product segment grew by 13.1%, still a healthy increase. Electric-powered radiator cooling is a growing application in North America, since Detroit carmakers

continued on following page
Interconnect Network, is a single-wire ination. LIN, which stands for Local

shaped direction of travel, speed and posi-

tion is received, including the de-

means of a LIN bus from which digital

HVAC flap actuators, which connect by

brand accounted for $346 million in sales

in 2008. The business

vehicle has between five and 10 flap ac-

conditioning system in a medium-sized

actuators and headlamp actuators. An air-

two biggest applications are HVAC flap

box and some electronics. The brand's

systems, usually comprising a motor, gear-

electronics and flex foil circuits that are

moldings, laminations, die castings and

commutators, housings, magnets, plastic

models, laminations, die castings and

precision plastics. And it produces the

network widely used throughout the auto

industry to transmit limited amounts of

data. Using data-bus actuators saves wir-

ing and reduces the number of connectors

required. Each device has just three con-

necting pins, compared with five pins if

no bus is used.

Saia-Burgess is the number-one sup-

plier of headlamp actuators in a market

that is growing quickly. Headlamp level-

ing was recently mandated in India and

China. And in Europe, where leveling has

been mandated since 1993, applications

are growing for controlling headlamp di-

rection in the horizontal plane, for corner-

ing. “Five years ago in Europe we had just

one motor per headlamp, but now there

can be as many as three motors per

headlamp,” said Mr. Lorenz. Valeo and

Hella are two of Johnson Electric's largest

headlamp-actuator customers. The com-

pany's experience with HVAC LIN

bus actuators is applicable to headlamp

actuators as they too are being connected

to a LIN bus.

Highly Vertically Integrated

One of the major distinctions about

Johnson Electric is the degree to which its

manufacturing is vertically integrated.

The company manufactures all the com-

ponents from which motors are made:

shafts, gears, bearings, carbon brushes,

commutators, housings, magnets, plastic

models, laminations, die castings and

precision plastics. And it produces the

electronics and flex foil circuits that are

sometimes a part of motor assemblies.

“We control all the elements of our

production, the whole value chain includ-

ing the manufacturing tools, which we

also make,” said Mr. Lorenz. “We are more

vertically integrated than any of our com-

petitors.” Johnson Electric also builds its

own assembly fixtures, plastic molds and

armature winding machines.

“We have our own materials laborato-
ies where we check the steel coming in,

the plastic resin, the copper,” added Mr.

Dick. “We buy the raw materials in huge

volume, and we can specify material that

is controllable and reliable, and that gives

us great confidence in the long term per-

formance of our products.”

Because its factory employment is con-

centrated in low cost countries, primarily

China, Johnson Electric can rely heavily

on labor to perform many tasks that might

otherwise be automated, which is evident

in the company's extremely low ratio of

sales per employee—just $54,920. And

yet, says Mr. Dick, “Labor content as a

percentage of product cost is very low.

We have a higher ratio of employees to

sales than some of our competitors because we

are so vertically integrated and that adds
to our employee numbers. We tend to run

a very Japanese style production system,

which is highly fixtured for precision but

requires lots of labor. We don’t use mate-

rial handling equipment and those kinds

of things. Our plants are spotlessly clean

and highly efficient.”

As some Chinese labor rates rise,

Johnson Electric can go to places within

China where the labor rates are still rela-
tively low. “Depending on which region in

China you are in, you have quite a signifi-
cant difference in wages,” noted Mr.

Lorenz. “It’s not always south China; it

can be northern or central China, and we

can also look to other countries such as

Vietnam.” In Europe, Johnson Electric has

relocated some production from Switzer-

land to Hungary.

The company’s largest factory complex,
called Johnson City because it is bigger

than some cities, was established in 1982

when the company moved manufacturing

operations to Shajing, China. Johnson

City is a vertically integrated complex

employing 30,000 workers in 26 facilities

with a total of five million square feet of

Saia-Burgess Automotive Motion

and Actuation Systems Sales*

2001 to 2008 CAGR: 17.0%

$ millions

FY 2001 2002 2003 2004 2005 2006 2007 2008

115 126 161 202 258 293 333 346

*Sales are Hansen Report estimates. Saia-Burgess

was acquired by Johnson Electric in November 2005.

Prior to the acquisition, Saia-Burgess reported sales

on the calendar year.
plant. More than 80 suppliers are located 
within or around the facilities. Workers 
also live in Johnson City, where the com-
pany maintains 29 dormitory buildings, 
including a central kitchen that serves 
80,000 meals a day, as well as a fitness 
center, cyber cafe and karaoke/dance hall.

**Acquisitions**

While many people still think of 
Johnson Electric as an Asian firm, the 
company has transformed itself through 
acquisitions into a global supplier. Asia 
accounted for just 14% of Automotive 
Products Group sales in fiscal 2008. The 
bulk of automotive sales, 61%, were in 
Europe; the Americas accounted for 25%.

Having a global organization is essen-
tial to success. “You have to develop close 
to where your customers are,” said Mr. 
Lorenz. “If you work with BMW engi-
neers, you cannot wait for someone in 
Asia to come and talk to them in English. 
You have to be able to jump in your car 
and go into the lab and talk with them in 
German.”

Future candidates for acquisition would 
be companies who offer new technology 
that fits with Johnson Electric’s product 
road map, and who serve those regional 
markets the company has targeted for 
growth.

**Recent Acquisitions**

1999: In a move that effectively 
doubled its sales, Johnson Electric pur-
chased the Electric Motor Systems 
business from Lear Corporation for $310 
 million. EMS employed 2,300 people in 
seven countries in Europe and North 
America. The automotive part of that 
business, known as Gate, based in Asti, 
Italy, was the European market leader for 
radiator cooling fan modules with sales of 
about $200 million. The EMS business 
had originally been owned by United 
Technologies. Johnson Electric financed 
the acquisition with surplus cash reserves 
and short-term borrowing.

2001: Johnson Electric acquired the 
fuel pump armature and cruise control 
stator product lines from Kautex Textron, 
a business with annual revenues of $16 
 million.

The company purchased the automo-
tive electric seat motor product line from 
ArvinMeritor, a business with about $50 
 million in sales.

Johnson Electric bought out the minority 
JV partners of MMA & Gate do 
Brasil, which makes cooling fan modules 
for local markets. Annual revenue: 
$20 million.

2002: Bitron, Johnson Electric’s Italian 
partner, in the joint venture Brushless 
Technology Motors, was bought out in 
2002. BTM makes brushless motors for 
HVAC applications. Annual revenue: 
$24 million.

2005: Saia-Burgess, maker of motor 
subsystems for door locks, headlamp level-
ing and HVAC flap actuators, became a 
Johnson Electric company in November 
2005. At the time, the automotive divi-
sion of Saia-Burgess had annual sales of 
about $320 million. Shortly before the 
acquisition, Saia-Burgess had acquired 
CEI Company, the largest maker of DC 
motors for vehicle air-conditioning sys-
tems in the U.S. Saia-Burgess was a public 
company with headquarters in Switzer-
land.

Parlex Corporation, a Nasdaq-listed 
firm with headquarters in Methuen, Mas-
sachusetts, was also acquired in Novem-
ber. Parlex, which makes flexible printed 
circuits, produced $47 million in sales and 
a net loss of $2.1 million in FY 2005.

Johnson Electric purchased the major-
ity capital of China Autoparts (CAI), a 
supplier of engine blocks for the local 
automotive market. CAI had sales of about 
$30 million.

Also acquired was the majority of the 
capital in Shanghai Ri-Young, the market 
leader for radiator cooling fan modules in 
China, with sales of approximately $60 
 million. ♦

#### Products (Motors and Motor Assemblies)

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<td>Sensor fans</td>
</tr>
<tr>
<td></td>
<td>Chassis, Braking</td>
<td>Oil pumps</td>
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<td></td>
<td>Body, Climate</td>
<td>Circulation pumps</td>
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<td></td>
<td>Chassis, Braking</td>
<td>HVAC blowers</td>
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<tr>
<td></td>
<td>Body, Climate</td>
<td>Saia-Burgess Automotive</td>
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<tr>
<td></td>
<td>Chassis, Braking</td>
<td>Air-conditioning actuators</td>
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<td></td>
<td>Body, Climate</td>
<td>Headlight adjustors</td>
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<td></td>
<td>Chassis, Braking</td>
<td>Door latches</td>
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<td></td>
<td>Body, Climate</td>
<td>Pushbutton switches, e.g.</td>
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<tr>
<td></td>
<td>Chassis, Braking</td>
<td>tailgate, window</td>
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<tr>
<td></td>
<td>Body, Climate</td>
<td>Controllers</td>
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#### Johnson Electric Worldwide

<table>
<thead>
<tr>
<th>Engineering Locations</th>
<th>Manufacturing Locations</th>
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<tbody>
<tr>
<td>China</td>
<td>China</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>(5 sites)</td>
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<tr>
<td>Shanghai</td>
<td>Argentina</td>
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<td>Shajing</td>
<td>Brazil</td>
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<tr>
<td>Germany</td>
<td>France</td>
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<tr>
<td>Dresden</td>
<td>Germany (3 sites)</td>
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<tr>
<td>Oldenburg</td>
<td>France (3 sites)</td>
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<tr>
<td>Italy</td>
<td>Hungary (2 sites)</td>
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<tr>
<td>Asti</td>
<td>China</td>
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<td>Israel</td>
<td>Japan</td>
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<tr>
<td>Yokneam</td>
<td>Japan</td>
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<td></td>
<td>(5 sites)</td>
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<td>Poland</td>
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<td>Switzerland</td>
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<td>Tunisia</td>
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<td>UK</td>
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<td></td>
<td>USA (5 sites)</td>
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<td>USA</td>
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</tbody>
</table>

Johnson Controls, BorgWarner, TRW, Autoliv, Aisin Seiki and Continental.

Bosch will succeed because of its undeniably great culture of technology and strong global footprint, which even manages to penetrate the tough Japanese domestic market through a number of joint ventures.

One of the biggest reasons Denso and Aisin Seiki will succeed is because they are partially owned by Toyota, probably the world’s most successful automaker. That relationship allows them to safely develop new technology in partnership with Toyota, technology they can later offer to other carmakers. One example of that strategy is hybrid vehicle technology, in which Toyota leads the world. “Both companies have a great business model,” said Mr. Sanderson.

He also noted that Johnson Controls is a well run company with a commanding position in batteries, and one that is constantly pushing technology forward with regard to interior electronics and integration.

Mr. Sanderson believes Borg Warner is an excellent, very well managed company, laser-focused on powertrain fuel economy and emissions. It has a leading position in turbochargers, a fast growing segment of Borg Warner’s market.

TRW has strong global positions in active and passive safety and controls, and Autoliv is strong in passive safety.

Continental is well positioned in the growth segments of the industry with a wide scope of technologies and strong market-share positions that only Bosch or Denso could challenge.

What Distinguishes Winners from Losers?

According to Mr. Sanderson, by looking at company data such as market share, competitive positioning, growth and profitability, he sees suppliers fitting into three categories. The top level performers are making the highest financial returns and growing their businesses despite the many market difficulties. The middle level are barely making their cost of capital. The third level suppliers aren’t making their cost of capital, are losing money or are already in bankruptcy.

Regardless of which category a supplier is in, it needs to periodically answer these questions, says Mr. Sanderson: “If you could take apart your company and put it back together again in the most efficient way, what would it look like? Where on the globe would you locate engineering centers and manufacturing? What about your portfolio of businesses—which are positioned in the current and future areas of growth? Which are your most valuable customers and why? Which are your lead customers for new technology?”

Leadership

“It really comes down to leadership,” says Mr. Sanderson. “A number of companies and their leaders have been in a state of denial about their true situation. They sit and they watch and hope that things will be better next year. But things don’t get better on their own. The companies with strong, competent leadership continually chart a long term course through the same environment that is crushing some of their peers. They are not lucky; they earn their success,” he declared.

“You can demand many things of an organization, but commitment and loyalty cannot be bought; they must be earned every day. Too many companies and leaders fail in this regard. There is a war for talent in our industry, and some companies are losing the war.”

Strong Management

We asked Mr. Sanderson which of his many accomplishments he is most proud of. He might have mentioned his participation in Siemens VDO’s acquisition of Huntsville Electronics, Chrysler’s in-house electronics subsidiary. He might also have noted the modern UAW agreement he negotiated, which made that acquisition work. Or he might have mentioned taking Huntsville from $1.0 billion in sales to $3.5 billion during his tenure. Instead, he talked about the people who worked for him.

“I’m very proud of the management team I put together at Siemens VDO—the people and how well they worked together,” said Mr. Sanderson. “They were performance driven. They refused to accept the possibility of failure and were always willing to change their approach until success was certain. ... You have to select really good people, the best people you can find, and you have to develop people.”

Sales Growth

“If you are not growing, you are dying,” warned Mr. Sanderson. “Something is wrong with your business and must be fixed. ... You need growth fueled by compelling technical advantage.”

Sales growth is essential to offset rising costs; without it, it is almost impossible to maintain or grow profits. “You have to be able to offset cost-of-living increases in wages. You have to offset the year-to-year price reductions for your customers. You have to offset the rise in prices for commodities such as electronic components, steel, copper and resin. And you have to offset rising costs for health care, energy, logistics and infrastructure.”

Number-One or Number-Two Share Position Essential

“You must have some compelling advantage that separates you from the competition. If you can’t develop a focused strategy that makes you the number-one or number-two player in each of your markets, you should exit those businesses,” advised Mr. Sanderson. “Siemens did a study of each of its business fields, including 40 automotive fields, looking at performance over a five-year period. The results were clear. The businesses with number-one or number-two positions made good returns, those with number-three positions broke even, and the rest struggled or lost money.”

All Customers Are Not Equal

“All customer relationships are very important, but they are not equal. ... For example, at Siemens VDO we liked to do business with first movers on powertrain technology. We chose companies like Mercedes, Renault or BMW because Europe has always had higher gas prices and therefore carmakers there tended to lead in fuel economy and emissions technology. U.S. carmakers tended to lead in active and passive safety and controls, and their technology was very similar between Germany and the U.S. Therefore, if you were a smart investor, you would choose German companies like Bosch, or Denso or Aisin Seiki. They are partially owned by Toyota, probably the world’s most successful automaker.”

Ours is a very tough and demanding industry. Still there are many opportunities for growth and success for companies that have the leadership and competence to compete on a global basis,” concluded Mr. Sanderson.