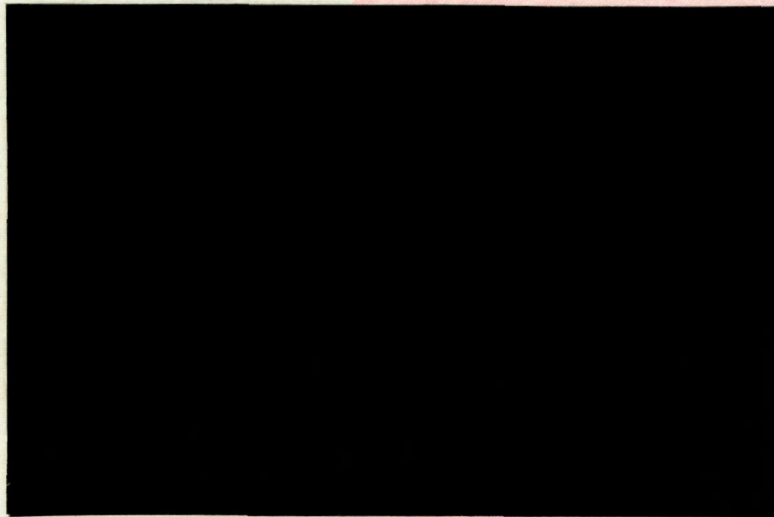


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Stichting Onderzoek Multinationale Ondernemingen
Centre for Research on Multinational Corporations



JOHNSON CONTROLS
A COMPANY PROFILE

Report written on behalf of the
EUROPEAN TRADE UNION COMMITTEE
TEXTILES, CLOTHING and LEATHER

MARIJKE SMIT

January 1994 ~~5~~ 5

Stichting Onderzoek Multinationale Ondernemingen (SOMO)
Center for Research on Multinational Corporations

Keizersgracht 132, 1015 CW Amsterdam, The Netherlands
tel. +31-20-6391291; fax +31-20-6391321

CONTENTS

1.	Introduction	2
2.	History	3
2.1.	Acquisitions	3
2.2.	Joint ventures	4
3.	Activities	5
3.1.	Automotive seatings	5
3.1.1.	Innovation	5
3.1.2.	Market share and major customers	7
3.2.	Control systems	8
3.3.	Plastic packaging	10
3.4.	Automotive batteries	11
4.	Production of Automotive Seatings	13
4.1.	European automotive seat locations	13
4.2.	Recent developments in the European automotive segment	14
4.2.1.	Supplier of Ford in Europe	16
4.2.2.	Supplier of Volkswagen in Europe	16
4.2.3.	Supplier of Rover in Europe	17
5.	Social Policy	18
6.	Structure	20
7.	Strategic Policy	21
8.	Financial Performance	23
9.	Conclusion	27
	Appendix: Johnson Controls and its main subsidiaries	28

1. Introduction

Johnson Controls is based in Milwaukee, Wisconsin in the United States of America (US).

It is a worldwide operating company with four core activities:

- automotive seatings (42 % of net sales)
- control systems (33 % of net sales)
- plastic packaging (14 % of net sales)
- automotive batteries (11 % of net sales)

In 1994 net sales amounted to \$ 6,870.5 million. Johnson Controls employs 54,800 people on more than 500 locations.

In this report the main focus will be on automotive seatings. Special attention will be paid to the company's automotive seating activities in Europe.

2. History

The foundation year of the company is 1885. Its founder, Warren Johnson, invented the thermostat that year. From 1885 through 1978 the company's operations were predominantly in the controls business.

In 1900 the company was incorporated in Wisconsin as Johnson Service Co. Its present name - Johnson Controls Inc. - was adopted in December 1974.

2.1. Acquisitions

Johnson Controls acquired (and dispossessed of) a number of companies over the last 20 years.¹

In 1978 Johnson Controls acquired Globe-Union Inc. for \$ 100 million in cash. In 1980 Globe-Union was dissolved and its operations became an operating division of the company: the Batteries Group.

In 1980 Johnson Controls sold its Centralab Electronics division to the North American Philips Corp.

In 1982 Johnson Controls acquired the European controls group of International Telephone & Telegraph Corporation.

In 1985 the company acquired Hoover Universal (automotive seating and seating components; plastic containers and plastic blowmolding machinery) for \$ 219 million in cash. The same year Ferro Manufacturing Corporation was acquired for \$ 98 million in cash. Later that year a number of business units obtained with the acquisitions of Hoover Universal and Ferro were sold for \$ 217 million.

In 1987 Peacher-Schwank Plastics Inc. and Apple Container Corp. were acquired.

In 1988 Johnson Controls acquired the assets associated with the Monopet hot fillable bottle technology of Monsanto. This acquisition included a technology exchange and licensing agreement with Yoshino Kogyosho of Japan. The same year four plastic PET beverage bottle making facilities were acquired from American National Can Co.

In 1989 Johnson Controls continued its acquisitions in the field of PET bottles by buying a majority interest in Fanini F.A.I.N. SpA in Italy.

Pan Am World Services Inc., a leading provider of operations and maintenance services for military bases, space centres and other government installations worldwide was acquired for \$ 167 million (name changed to Johnson Controls World Services Inc.); this acquisition significantly expanded the controls business.

Johnson Controls took an interest in E.A.H. Naue GmbH & Co. KG of West Germany, a seating and foam seating producer (the rest was acquired in 1992), and Polypack of Brecht, Belgium.

In 1990 Johnson Controls acquired Varta Ltd.

In 1991 the company acquired Lahnwerk GmbH, a German supplier of wire seat components and metal seat frames for the European automotive industry.

In 1992 Servidyne Inc. sold certain assets for the maintenance, repair and retrofit of commercial building chiller equipment to Johnson Controls.

¹. Moody's Industrial Manual, 1994; Annual Report, 1994.

In 1993 Johnson Controls acquired a minority interest in certain assets of Grupo Summa, a producer of complete seats and seating components for the Mexican automotive market. Assets included four seating facilities near Mexico City. Also in 1993 JMB/Urban Co. of Chicago sold its mechanical and electrical operations and maintenance unit to Johnson Controls. The same year the US Container manufacturing facility in Orlando was bought. Furthermore, JWP Inc.'s Network Integration Services was acquired.

In 1994 Johnson Controls acquired two automotive soft trim facilities from the Acustar Division of Chrysler Corp. Involved are the production of fabric and leather covers for automotive seats and engineering support. Two manufacturing facilities are included: Canadian Fabricated Products in Stratford, Ontario, Canada and EDIASA in Juarez, Mexico. The engineering support plant is based in Detroit, US. The facilities combined employ 2,400 people; the operations' sales are expected to top 200 million dollars annually.

In the same year the company acquired Procord Ltd in the UK, a leading operations and maintenance services company in its home country, formed in 1991 following a management buy-out of the property division of IBM. Major customers of Procord are IBM, British Petroleum and British Gas. More than 360 people are employed.

2.2. Joint ventures

Johnson Controls is engaged in a number of joint ventures. The joint ventures in the controls business are in the Far East.

In 1989 Johnson Controls and Yokogawa Electronics Corp. concluded a co-equal joint venture agreement in which Johnson Yokogawa Corp. was established (in 1989 and 1990) in order to manufacture and market process control instrumentation and to integrate and service industrial automation systems for the North American market.

In 1993 Johnson Controls announced a joint venture between its Automotive System Group and Bertrand Faure, a French seat manufacturer, has been chosen to supply complete seats for the 1995 Ford Escort/Orion and the 1996 Ford Fiesta (see below).

Also in 1993 Millet P.E.T. Packaging SA was established, a joint venture between Johnson Controls and the French Millet SA. The new company manufactures P.E.T. plastic preforms, bottles for carbonated soft drinks and mineral water, and other P.E.T. containers in France.

In 1994 Johnson Controls formed a new joint venture with Commercial City Building Management Pte. Ltd of Singapore. This joint venture, Acropol Johnson Controls World Services (S), is the first operations and maintenance services company in Singapore, servicing 30 buildings.

Another joint venture in the controls area was formed with Projek Penyelenggaraan Lebuhraya Berhad (PROPEL) in Malaysia (850 employees) under the name Propel-Johnson Controls World Services (M) Sdn. Bhd. Johnson Controls' stake in this joint venture is 49 percent.

In 1994 Johnson Controls set up another joint venture for its controls business in Thailand. In the joint venture Johnson Controls has a minority interest (19 %). Tonkah Harbour Plc is the majority shareholder (61 %). Four other local companies each own 5 %. The firm expects to manage 15-20 office towers in Bangkok in its first year.²

². Bangkok Post, August 22, 1994.

3. Activities

All four of the company's business segments have sales to the automotive industry. General Motors Corporation accounted for 9 % of Johnson Controls' sales in fiscal 1993, 12 % in 1992 and 11 % in 1991. The three major US automotive manufacturers accounted for between 4 % and 12 % of sales in each of the above-mentioned years.³

The four core activities of Johnson Controls are described in more detail below. Most attention is paid to automotive seatings.

3.1. Automotive seatings

The Automotive Systems Group of Johnson Controls has its headquarters in Plymouth, Michigan. The Group employs more than 21,000 people at 90 facilities worldwide.⁴

Johnson Controls designs and produces complete seat systems, seating components, and interior trim systems for cars, light trucks and vans in the US and Europe. Other products for the original equipment market include seat frames, tracks, mechanisms, covers and foam cushions.

In 1994 Johnson Controls produced seats for more than 6.5 million vehicles.

3.1.1. Innovation

The company has complete in-house capabilities, from R&D through design, manufacturing and delivery. Johnson Controls uses a nine-phase Product Introduction Process in order to successfully launch new products.

In 1994 a new Urethane Technology Center was built at its headquarters to house its seat cushion and cover engineers.

In 1994 an innovation was under study to make it easier to get in and out of a car. This was earmarked as a growing consumer need in the US as the population ages. The seat cushion and seat back pivot toward the door. The version for sport cars has a seat bolster that drops below the surface of the seat cushion when the door opens.

Furthermore, the company is developing a self-adjusting seat which senses body pressure and heat, then automatically inflates air bladders inside the seat to provide a custom seat fit.

A new Integrated Belt-In-Seat System is now ready for production. The integrated seat has a lap belt and shoulder harness built into the seat itself and bolted to the floor pan (instead of being attached to the vehicle's B-pillar as with current seat belt systems). Wearers can

³. Form 10-K, 1993.

⁴. PR Newswire (Reuter Textline), November 2, 1994.

adjust the seat without having to unbuckle the belts first. This new seat technology will be used for the first time in a vehicle starting in 1996.

In 1994 Johnson Controls and EASi Engineering have launched a 18-month research program to investigate new vehicle seat designs for improving occupant safety in front-, rear- and side-impact crashes as well as roll-over accidents. The National Highway Traffic Safety Administration (NHTSA) funded the project with US\$ 200,000. NHTSA was established by Congress in 1966 in order to reduce deaths, injuries and economic losses resulting from motor vehicle crashes. EASi Engineering of Bingham Farms, Michigan is a top firm involved in automotive product and computer-aided engineering.⁵

Johnson Controls is still working on an new seating system that could improve safety in side-impact collisions. This system features a built-in airbag mounted on the side of the seat's headrest area.

In November 1994 a HYGE (hydraulically controlled gas actuated) Crash Stimulator of US\$ 2.8 million was installed at Johnson Controls. In January 1995, the company will set up a head-impact test station at its Plymouth technology center. This addition will turn Johnson Controls in the first complete seat supplier in North America to offer full, in-house crash testing capabilities according to Federal Motor Vehicle Safety Standards (FMVSS).⁶

Johnson Controls develops proprietary seating technologies. This development often starts with focus groups and product clinics, where the company gains insight into consumer likes and dislikes in the areas of function, quality and comfort, or with questions of car producers, wanting to reduce weight and to increase safety. The company, for example, has started to produce its next generation power seat track mechanisms. The challenge was to develop a power seat track system, already found in the world's top luxury cars, at relatively low costs, so that it can be used in modestly priced vehicles. Johnson Controls succeeded in doing this. The result is that the system will be part of the seating systems Johnson Controls makes for a dozen vehicle models.

Johnson Controls uses Uni-Trim. This is a method of bonding seat covers to foam cushions, which produces seats with deeper contours and increased durability. The labour-intensive stitching of the seats is reduced by this method. Uni-Trim has been used for several years for certain light truck seatings. In 1994 Uni-Trim was also used in Saturn cars and in the new Chrysler Cirrus.

In Europe Johnson Controls expects to be required soon to recycle seating materials. Perhaps the US will require this later, too. Therefore, the company is focusing research efforts to ensure easier recyclability of new seating systems.

⁵. PR Newswire (Reuter Textline), November 17, 1994.

⁶. PR Newswire (Reuter Textline), November 2, 1994.

3.1.2. Market share and major customers

Johnson Controls' **market position** in this field is strong: Johnson Controls is world's largest independent supplier of automotive seating systems and a leading supplier of automotive seating components, while operating only in North America and Europe. Some 10 years ago Johnson Controls was a relatively small player in this business.

Roughly 60 % of the automotive segment's sales over 1991-1993 were to the big three US car producers. In North America Johnson Controls competes with three independent suppliers of complete seats, four independent suppliers of foam seating components and six independent manufacturers of metal seating components. In Europe the segment primarily competes with automotive manufacturers and three independent suppliers.⁷

In North America Johnson Controls has a market share of 32 percent; its main competitor Lear Seating Inc., Southfield, Michigan leads with 34 %. Johnson Controls leads in Europe, with 22-30 percent. But Lear recently acquired Fiat's eight SEPI SpA seating plants in Italy and Poland for Pounds 160 million, which will help Lear to expand with Fiat in Eastern Europe and South America. The acquisition of SEPI could help jump Lear's share to 28 percent in Europe.⁸

Major customers of Johnson Controls include Audi, BMW, Chrysler, Ford, General Motors, Honda, Mazda, Mercedes-Benz, Mitsubishi, Nissan, NUMMI, Renault, Rover, Saturn, Toyota and Volkswagen.

Indicators of customers satisfaction are the many awards given by automotive producers to the company, like General Motors Worldwide Supplier of the Year, Nissan Quality Master Award, Toyota Superior Delivery Award and Volkswagen Formula Q Award. Johnson Controls has ISO 9000 Certification in several manufacturing facilities.

Increasingly automotive manufacturers are outsourcing their seating requirements to Johnson Controls in order to try to improve quality and reduce costs. Automotive seats are designed, engineered, integrated with surrounding parts and globally delivered by Johnson Controls. Johnson Controls boasts being "the most vertically integrated supplier in the industry with technical and manufacturing expertise not only in providing complete seats, but also in the individual seat components such as the frame, foam, mechanisms and trim cover".⁹

Toyota started a vehicle assembly plant in Georgetown, Kentucky, US in 1988. Since that date Johnson Controls is its sole seating supplier. In 1994 a new seating program for the Toyota Avalon was launched by Johnson Controls. Toyota increased its supplier base from 174 in 1993 to 237 in 1994. Toyota countered charges that the plant uses mostly Japanese-owned transplant suppliers. Out of the 237 suppliers 153 are US-owned, 41 Japanese-owned,

⁷. Form 10-K, 1993.

⁸. Automotive News, October 17, 1994; The Observer, October 16, 1994. The Observer mentions a market share of 30 percent in Europe, while Automotive News writes about 22 percent.

⁹. Annual Report, 1994.

37 joint ventures with US-owned companies and 6 are part of the Toyota Group. Besides seats Johnson Controls supplies batteries (see below).¹⁰

In 1994 Johnson Controls supplied a redesigned seat system for the **General Motors Blazer** and Jimmy.

Since 10 years Johnson Controls supplies **Chrysler** with complete seats. In 1994 Chrysler introduced its Neon, Cirrus and Stratus models; Johnson Controls again is the sole seating supplier for all three models. The Cirrus and Stratus are the first passenger car programs in which Johnson Controls is using its UniTrim cover bonding system (see above). The Mount Clemens, Michigan facility of Johnson Controls started to produce seats for the Cirrus in Autumn 1994.

In 1994 Johnson Controls made over 1 million seats for Chrysler, more than it has ever produced in one year's time. The company builds almost all of Chrysler's seats, over 23,000 a day in six plants in North America.

Johnson Controls expects that new programs with car producers will add \$ 800 million in incremental sales in the US and \$ 800 million in incremental sales in Europe through 1998.

In the US this includes projects for Chrysler, Ford, General Motors and Mercedes-Benz.

The first **Mercedes** is scheduled to start production in Tuscaloosa, Alabama (US) in 1997.

Around 60,000-70,000 all activity vehicles will be built annually; half of them destined for the US market and half for export. Mercedes-Benz awarded Johnson Controls the contract to develop and produce complete seats for its new multi-purpose vehicle. Furthermore, Johnson Controls will supply modular 'headliners' (the covering for the interior of the roof) for this car. Johnson Controls will play the leading role in product design, development and manufacturing of the headliners, with support from its partners Roth Frères of Strasbourg, France and the Donnelly Corporation of Holland, Michigan (US). The contract will create approximately 200-250 jobs at the company. Mike Dodge, Automotive Systems Group Vice President and General Manager of North American Operations, said: "We're extremely excited to be involved in this project. Mercedes is an important customer for us in Europe and we are looking forward to working with them here in the United States."¹¹

After Johnson Controls won the Mercedes-Benz contract for supplying its new factory in the US, Johnson Controls started design and development work at its facility in Wermelskirchen. Later on this was transferred to Plymouth, US.

In Europe the \$ 800 million include a contract to supply all seating systems for the **Ford Escort/Fiesta** starting in 1995 (see 4.2.1).

3.2. Control systems

Johnson Controls is active in the field of installation and service of facility management and control systems. It takes care of retrofit and service of mechanical equipment and lighting systems in non-residential buildings and on-site management of facility operations and

¹⁰. Annual Report 1994; Autoparts Report, June 1, 1994.

¹¹. PR Newswire (Reuter Textline), February 23, 1994.

maintenance. These activities include energy management, temperature and ventilation control, security and fire safety.

This segment also manufactures a broad line of electric and electronic products for sale to original equipment manufacturers, wholesalers and distributors of air-conditioning, refrigeration, commercial and residential heating, gas-burning and water-pumping equipment.

Johnson Controls used to sell most of its product lines only through company-owned branch offices. This changed in 1994 with the Authorized Building Control Specialist (ABCS) program, which creates strategic partnering agreements with quality independent temperature control companies. Over 30 ABCS companies signed on in its first year.

Johnson Controls' **market position** in this area is strong: the company is a leading worldwide supplier of facility services and control systems to education, health care, office, government, industrial and retail buildings.

Customers include Ameritech, Bank of America, Glaxo, IBM, JC Penney and Kaiser Permanente. Other customers are 7,000 US school districts, more than 2,000 hospitals and tens of thousands of other non-residential government buildings.

The company offers full-time, on-site staff and management to handle the operations and perform maintenance for its major customers. In a Johnson Controls performance contract, the improvements to a building pay for themselves through the energy savings they generate. The most important control product is the Metasys Facility Management System, that integrates environmental control, energy management, fire management, access control, maintenance management, lighting control and overall facility monitoring in commercial buildings. Between 1990 (the year of introduction) and 1995 over 7,000 Metasys systems have been installed over the world. Some examples of Metasys are the Chrysler Technology Center outside Detroit and the Eiffel Tower in Paris.

In 1994 LaSalle Partners of Chicago and Johnson Controls won a 5-year contract with Ameritech to provide property management services to its 48 million sq.ft. portfolio of properties on 3,600 locations in the US states of Illinois, Indiana, Michigan, Ohio and Wisconsin. LaSalle is responsible for property management, financial management, information systems and vendor management and Johnson Controls will manage building operations, maintenance and technical support for all sites. Revenues for Johnson Controls will be around 60 million dollars annually.¹²

Johnson Controls leverages its knowledge of facility management systems for commercial buildings to the emerging home energy automation market in the US as well. An intelligent thermostat/controller manufactured by Johnson Controls is installed for approximately 25,000 residential utility customers in Ohio, Virginia, West Virginia, Kentucky, Indiana and Michigan.¹³

¹². National Real Estate Investor, August 1994; Reuter News Service, March 24, 1994.

¹³. PR Newswire, March 28, 1994.

Indicators of customer satisfaction are some awards of these customers -like IBM Quality Supplier Award- and energy management savings.

Johnson Controls has ISO 9000 Certification in all its US and European manufacturing facilities.

3.3. Plastic packaging

Johnson Controls is producer of plastic containers for beverages (liquid, water and juices), food, pharmaceuticals, personal care products, and household items. Its main product is polyethylene terephthalate (PET) plastic containers.

The company takes care of the manufacturing, installation and service of plastic blowmolding machinery systems. The blowmolding machinery is designed and produced by Johnson Controls for five principal plastics processing systems: reciprocating extrusion, blowmolding, continuous extrusion blowmolding, injection blowmolding, accumulator head blowmolding and structural foam. Plastic products, including injection-moulded plastic gears, fan shrouds and radiator end tanks, are also produced for the North American automotive original equipment market.

The company is the most integrated PET bottle manufacturer in the industry. In 1994 -after 5 years of R&D at Johnson Controls- the US Food and Drug Administration issued a no-objection letter for its proprietary supercleaning recycling process, known as Supercycle. Supercycle should reduce the cost of recycling used PET bottles into new PET bottles for food and beverages. Johnson Controls immediately doubled capacity at its recycling facility at Novi, Michigan.

In the US over 30 percent of PET containers are recycled; in Europe about 4 %. In Europe the company joined with other packaging manufacturers to create a new association to coordinate and increase European PET recycling.

Johnson Controls also has the technology to develop and manufacture its own tooling and proprietary precision blowmolds.

Johnson Controls' **market position** is very strong. The company is world's largest producer of PET plastic containers. Furthermore, it is a leading worldwide supplier of plastic blowmolding machinery, injection mould tooling, and parts.

Major customers of its plastic containers include Aquapenn, Beverage Associates, Cadbury Beverages, Coca-Cola, CPC International, Dr. Pepper/Seven-Up, Hunt Wesson, LeBleu, Ocean-Spray, Pepsi-Cola, Procter & Gamble, Perrier Group of America, Running Springs, San Pellegrino, Schweppes and Vittel.

Major customers of its plastic blowmolding machinery systems include Baxter Healthcare, Clorox, CMB, Colgate-Palmolive, Conoco, Nestlé, Plysu, Revlon, Rubbermaid and Shell.

In 1994 a new preform manufacturing plant was opened near Prague in the Czech Republic. Johnson Controls has built a new R&D center at its plastics headquarters in Manchester, Michigan in the same year.

One of the largest projects ever undertaken by its machinery business was the turnkey installation of a blowmolding system for Shell-Brazil. It concerned the delivery of a total system for high volume production of quart and 20-liter oil containers.

Other examples include the use of Johnson Controls machines by Nestlé to make containers for drinkable yoghurt and by Colgate-Palmolive to make detergent and bleach containers in Mexico.

Indicators of customer satisfaction include some awards, like Beverage World 'Green Award' for proactive recycling efforts.

Self-certification programs are in place with major customers.

3.4 Automotive batteries

Johnson Controls is producer of lead-acid automotive batteries for the replacement and original equipment markets. Specialty batteries for telecommunications and uninterruptible power supply (UPS) applications are produced as well. This segment started the year 1994 with 4,860 employees.

In the field of R&D Johnson Controls is closely watching the developments around electric vehicles. The State of California mandates the sale of electric vehicles starting in 1998; this will probably be followed by other states. It is expected that the first batteries used will be the lead-acid ones. Johnson Controls has been involved in improving battery performance for electric vehicles for over 20 years. Johnson Controls started a three-year program in 1993 to develop lithium polymer batteries for future electric vehicles. Furthermore, in 1994, the company joined Ford Motor Company's five-year cooperative research program aimed at developing 'hybrid' electric vehicles that could demonstrate increased fuel economy, reduced tailpipe emissions and new ways to use alternative fuels.

Johnson Controls' **market position** is strong on its home market. It is a major supplier to the North American automotive battery market. It is the number 2 supplier of batteries to car producers in North America, behind AC Delco Systems, a unit of General Motors' Automotive Components Group Worldwide.

Major customers include AutoZone, Carport, Caterpillar, Chrysler, Diamond-Star, Ford, Honda, Interstate Battery System of America, John Deere, Kmart, Mazda, Nissan, Price/Costco, Toyota and Wal-Mart.

Johnson Controls largest battery customer is Interstate Battery System of America (IBSA). IBSA is the largest-selling brand of replacement automotive batteries in the US through 205,000 dealers in the US (and Canada). Johnson Controls supplies 100 percent of IBSA's batteries.

AutoZone is a chain of more than 900 retail auto part stores in 23 US states, which is growing fast. In 1994 more than 130 new stores were opened. Johnson Controls supplies most of its batteries.

In 1994 Johnson Controls started supplying automotive batteries to 500 select Kmart stores in the US.

In April, 1994 Johnson Controls heard it lost a very important customer: Sears, Roebuck and Co. Sears is buying its 6.2 million DieHard batteries a year starting October 1, 1994 from AC-Delco of General Motors and Exide Corp. Johnson Controls was the developer and manufacturer of these batteries and supplied them since its introduction in 1967. Sears said

there was no No.1 reason to end the contract. It said it looked at a range of concerns, including quality, price, logistics and distribution. The Sears account of around 170 million dollars a year represented 20-25 percent of Johnson Controls' overall battery sales.

In 1994, after Sears' decision, Johnson Controls reduced its work force, closed two battery plants and announced plans to close two additional battery plants in 1995 (one in Owosso, Michigan with 269 employees and one in Dallas, Texas with 320 employees). One of the factories closed in 1994 was the one in Bennington, Vt with 320 employees. In Tampa, Florida 100 employees -one-third of the workforce- lost their jobs. In September 1994 production for the local market started in a new plant with 75 employees in Torreon, Mexico.¹⁴

In 1994 aircraft battery manufacturer Saft, a subsidiary of Alcatel-Alsthom, agreed to buy the aerospace battery activities of Johnson Controls and Gates Corporation.¹⁵

Indicators of customer satisfaction include awards and certification given to Johnson Controls by these customers, like Caterpillar Quality Supplier Certification, Ford Total Quality Excellence (TQE) Award and AutoZone's Extra Miler Award.

Ford's TQE Award is very prestigious. Only 26 of the hundreds of suppliers to Ford achieved TQE status since the program was established in 1987. Johnson Controls received the Award together with 6 other suppliers in 1994.¹⁶

Johnson Controls obtained ISO 9000 Certification of specialty battery manufacturing plant.

In 1991 the company produced 24 million batteries in 14 plants; in 1997 Johnson Controls plans to produce 33 million batteries in 9 plants.

¹⁴. Annual Report 1994; American Metal Market, October 17, 1994; Automotive News, October 17, 1994; New York Times, August 5, 1994; Tampa Tribune, June 8, 1994; Contract Journal, May 5, 1994; Milwaukee Journal, April 21, 1994.

¹⁵. Interavia, February 1994.

¹⁶. PR Newswire (Reuter Textline), November 3 and 4, 1994.

4. Production of Automotive Seatings

Johnson Controls produces automotive seatings both in the US and Europe and plans to expand both.

In the US Johnson Controls plans to build six Just-In-Time complete seat manufacturing plants and two component plants for the new projects with Chrysler, Ford, General Motors and Mercedes (see 3.1.2).

Johnson Controls owns numerous manufacturing facilities in the US. Plants are also located in Canada, Mexico and many European countries (see below). Its principal facilities (all divisions) aggregate approximately 24 million sq.ft. of floor space.

4.1. European automotive seat locations

In the segment of automotive seats facilities -all types, production, administration and Research & Development- are based in about 90 locations (35 in the US).

The 44 European (existing and planned) automotive seats locations are the following:¹⁷

Austria

- Graz
- Mandling

Belgium

- Anderlecht (jv 35 %)
- Geel

Czech Republic

- Ceska Lipa
- Straz pod Ralskem (jv 70 %)

France

- 2 locations

Germany

- Bochum
- Cologne
- Espelkamp (2)
- Lahnwerk
- Lemforde
- Schwalbach

¹⁷. Annual Report, 1994; Moody's Industrial Manual, 1994; The Observer, October 16, 1994; PR Newswire, October 28, 1994; Financial Times, May 27, 1994.

- Opladen
- Wermelskirchen
- Zwickau
- 1 other location

Portugal

- Nelas
- Palmela
- Portalegre

Slovenia

- 1 location

Spain

- Barcelona (2)
- Mantorell
- Valencia
- Zaragoza

United Kingdom

- Burton-on-Trent
- Dagenham
- Essex
- King's Norton
- Leamington (jv)
- Leigh-on-Sea
- Liverpool
- Mansfield
- Shropshire
- Silloth
- Speke
- Staffordshire
- Telford (2)
- Wearside
- Wednesbury

4.2. Recent developments in the European automotive segment

In 1994 Johnson Controls opened four new plants in the automotive segment in Europe. In Mansfield, Nottinghamshire in the UK (450 jobs) and in Nelas, Portugal seat cover plants were opened. The Nelas plant is to supply Volkswagen's SEAT subsidiary. In Portalegre, Portugal a new seat cushion plant was opened. The same year construction started of a plant in Palmela, Portugal for the Just-In-Time supply of seating for a multipurpose van of a joint venture of Ford and Volkswagen. In Graz, Austria a plant was opened to make seats for the Jeep Grand Cherokee.

Since 1974 Johnson Controls has invested 82 million pounds in the UK with plants scattered from Sunderland (where it has a joint venture with **Nissan**), to Leigh-on-Sea in the South-East. Investment is set to increase by 36 percent to 112 million pounds by 1996.

In 1994 Johnson Controls started a new joint venture with the engineering company Adwest Group Plc of Warwick, UK. The joint venture, Adwest Johnson Controls, concentrates production on metal seating components in its new factory in Leamington Spa, Warwickshire, using equipment and 110 employees transferred from a nearby Adwest subsidiary IHW Engineering and 10 extra staff. Adwest Johnson Controls supplies **Nissan, Rover, Ford, Vauxhall, Volvo and Lotus**.

In September 1994 Trimco in the Czech Republic anticipated daily production of 330 luxury car-seat covers for **Opel, Ford, Chrysler and Volvo** models. Trimco is a joint venture between Johnson Controls (70 %) and ECA of Belgium (30 %). The new plant employs 300 people.¹⁸

Currently Johnson Controls supplies complete seats for many European vehicles, including:

- Ford Escort and Orion;
- Rover Mini, Metro and 200/400 Series;
- Volkswagen Golf A3 and Passat;
- Opel Astra and Vectra;
- Nissan Primera and Micra;
- Toyota Carina E;
- Renault Clio, Laguna and Twingo;
- SEAT Ibiza and Cordoba;
- Skoda Favorite and Forman;
- Jeep Grand Cherokee.¹⁹

The automotive segment of Johnson Controls in Europe has grown extremely rapidly over the last 7 years. **In 1987 Johnson Controls had only 300 employees working in 3 automotive seating locations in Europe. The company expects to have more than 7,500 European employees working in 44 locations by the end of 1995.**

Around 10,000 seats a day are being produced. Over the past few years not only complete seats were produced, but also the major seat subsystems, such as metal frames, mechanisms, foam cushions and trim covers.

Chip McClure, vice president and managing director of Johnson Controls Automotive Systems Group in Europe, sees a lot of opportunities for his company in Europe.

¹⁸. Hospodarske Noviny (Reuter Textline), September 27, 1994.

¹⁹. PR Newswire (Reuter Textline), October 28, 1994.

4.2.1. Supplier of Ford in Europe

As was mentioned above the joint venture between the Automotive System Group of Johnson Controls and the French seat manufacturer Bertrand Faure has been chosen as supplier of complete seats for the 1995 Ford Escort/Orion and the 1996 Ford Fiesta.

In 1994 the assembly of seats for the 1995 Ford Escort/Orion started for Ford's three locations in Europe:

- Saarlouis, Germany;
- Valencia, Spain;
- Halewood, United Kingdom.

Johnson Controls opened three new plants in the vicinity of its customer:

1. Johnson Controls new plant in Schwalbach, Germany is supplying 1,200 sets of finished seats a day to Ford's factory in Saarlouis near the French border, starting early 1995. About 200 new jobs are created.²⁰
2. Johnson Controls was the first company to open installations at the Almusafes Industrial Park near the Ford factory in Valencia. The company invested 2 billion pesetas in the new plant, which is supplying Ford with car seats.²¹
3. Johnson Controls has set up a plant in Speke, which is very near the Ford Escort factory in Halewood. It is a satellite unit employing 50 people.²²

In August 1995 the assembly of seats for the 1996 Ford Fiesta will be started for Ford's three locations in Europe:

- Cologne, Germany;
- Valencia, Spain;
- Dagenham, United Kingdom.

Johnson Controls and Bertrand Faure have or are establishing five new facilities in Germany, Spain and the United Kingdom for this new business. All locations will be dedicated Just-In-Time plants. At full production assembly of seat sets for around 6,000 Ford vehicles a day is expected. European production for the Ford Escort and Ford Fiesta in 1992 was 1,1 million vehicles.²³

4.2.2. Supplier of Volkswagen in Europe

In September 1994 a joint venture between Johnson Controls, Bertrand Faure and the Spanish Inespo started in the new Zona Franca industrial estate, set up in Barcelona to accommodate the redundant employees of Volkswagen subsidiary SEAT SA. Volkswagen is planning to reduce its workforce from 14,000 to 9,500. The joint venture of Johnson Controls and others

²⁰. Urethanes Technology, February 1994; Handelsblatt, December 27, 1993.

²¹. Expansión, January 21, 1994.

²². Daily Post, June 30, 1994.

²³. Moody's Industrial Manual, 1994.

is creating 487 to 900 jobs in two phases. 400 of the 487 employees are redundant employees of SEAT.²⁴

In September 1994 there was a labour dispute at Volkswagen's Brussels plant in Vorst (aimed annual production of some 190,000 cars), which might lead to important consequences for the suppliers. One of these suppliers is Synchro Partners in Anderlecht (Belgium), which was producing car seats for the Golfs and Passats. Synchro is a joint venture between Johnson Controls (via a Dutch holding company; 35 %), ECA of Assenede, Belgium (35 %) and Roth Freres of Strasbourg, France (40 %). Synchro represented an investment of 100 million Belgian Francs in fixed assets alone. At full capacity Synchro would employ some 125 people. These staff were not transferred from Volkswagen, which until shortly produced seats itself. Synchro preferred to recruit staff aged less than 26 in order to qualify for a number of state bonuses.²⁵

4.2.3. Supplier of Rover in Europe

Rover, which was acquired by BMW in 1994, for the first time outsourced its complete seat programs to the seat supplier, being Johnson Controls. Johnson Controls began supplying complete front and rear seats for Rover's 1995 Mini, Metro and 200/400 Series models in Autumn 1994. Johnson Controls uses its King's Norton plant, one of its newest facilities. King's Norton, near Birmingham, launched production in July 1994. In this factory 75 employees produce about 550 seat sets per day or about 140,000 seat sets annually, exclusively for Rover vehicles. The seats are delivered Just-In-Time for assembly at Rover's plant in Longbridge, UK. Johnson Controls has 6 plants in the UK that supply Rover with a range of components.²⁶

²⁴. Handelsblatt, July 11, 1994; El País, July 8, 1994; Expansión, February 12, 1994; La Vanguardia, February 12, 1994; Independent, February 12, 1994.

²⁵. De Financieel Economische Tijd, September 14, 1994.

²⁶. PR Newswire, October 28, 1994.

5. Social Policy

The total number of employees over 1990-1994 developed as follows:

1990: 43,500
1991: 42,700
1992: 46,800
1993: 50,100
1994: 54,800

About 21,000 (38 %) of the total number of 54,800 employees are working in the automotive seat segment. Johnson Controls has 6,500 employees in Europe. In the UK currently 1,470 people are employed; this number is expected to grow by 1,000 employees during 1995.²⁷

As was shown previously, Johnson Controls is expanding rapidly in the automotive seats segment in Europe. In this process new plants are opened and jobs created. For example, Johnson Controls started to operate from Britain's first industrial park set up for the automotive components industry. The company has built a Pounds 10 million plant on a 115-acre former-steelworks site in Wednesbury in the Midlands. The workforce is recruited from among the long-term unemployed. 130-160 jobs will be created. The park as a whole is scheduled to provide work for up to 3,000 people. The park is an idea of the government-sponsored Black Country Development Corporation, which is more than halfway through its 10-year plan to regenerate a 10-square-mile area of land left derelict by the decline of traditional industries.²⁸

Johnson Controls is benefiting from the UK's government's eagerness to attract investments and to create jobs. Johnson Controls is setting up a new factory to supply seats for the Ford Fiesta car which is built at Dagenham in the East Thames corridor. The Johnson Controls plant will employ about 150 people. The cost of the Pounds 15 million investment is shared with Ford. Johnson Controls formally applied for regional selective assistance of Pounds 750,000 from the UK government.²⁹

For its new plant in Mansfield (see above) the company received a Pounds 1.7 million grant from the Department of Trade and Industry to develop the site. The company claims that its 450 employees were formerly unemployed. New recruits first undergo a comprehensive 12-week, in-house training programme.³⁰

²⁷. PR Newswire (Reuter Textline), October 18, 1994.

²⁸. Daily Telegraph, November 9, 1994; Birmingham Post, September 12, 1994.

²⁹. The Guardian, November 7, 1994.

³⁰. Yorkshire Post, May 10, 1994.

Johnson Controls is not only creating jobs, but sometimes also losing jobs. Nissan in Sunderland, UK, for example, halved production in its plant between November 1993 and March 1994 because of the downturn in car sales in continental Europe. Ikeda Hoover, a joint venture between Johnson Controls and Ikeda Busan, is the supplier of car seats to the company. Ikeda Hoover, set up in 1986, employed 490 employees in Wearside, near Sunderland, but made people redundant following the Nissan move.³¹

In November, 1994 the Fourth Annual Quality Improvement Showcase was held, attended by more than 1,000 employees. In 1993 employees saved more than US\$ 12 million through efficiency and productivity increases, cost savings and cost avoidance measures. The Showcase honoured 33 of the 100 contesting teams from around the world for their achievements. Participants came from North America, Germany, UK and Singapore.³²

In the battery business more units will be produced in less plants and with less employees. Because of the closure of two battery plants in the US in 1994 all 589 workers were laid off.

³¹. Financial Times, November 23, 1993.

³². PR Newswire (Reuter Textline), November 3, 1994.

6. Structure

Johnson Controls' headquarters are in Milwaukee, Wisconsin. The company is listed on the New York Stock Exchange. The four core activities are structured into four divisions.

James Keyes (age 54) is the company's Chairman since January, 1993 and Chief Executive Officer (CEO) since 1988. John Barth (age 48) is Executive Vice President since 1992. Barth is general manager of the company's Plymouth, Michigan based Automotive Systems Group. He leads two other divisions (Plastics and Batteries) as well.

The list of the main officers of Johnson Controls is as follows:³³

- James H. Keyes: Chairman and CEO
- John M. Barth: Executive Vice President
- Joseph W. Lewis: Executive Vice President
- Steven J. Bomba: Vice President, Corporate Technology
- Susan F. Davis: Vice President, Human Resources
- Giovanni Fiori: Vice President, Plastics Technology Group
- Michael F. Johnston: Vice President, Battery Group
- John P. Kennedy: Vice President, Secretary and General Counsel
- William P. Killian: Vice President, Corporate Development and Strategy
- Charles G. McClure: Vice President, Automotive Division
- Stephen A. Roell: Vice President and Chief Financial Officer
- Ronald M. Williams: Vice President, Controls Division
- James F. Wilson: Vice President, Controls Division
- Denise M. Zutz: Vice President, Communication
- Ben C.M. Bastianen: Treasurer
- Franklin H. Smith Jr: Corporate Controller
- Jerome D. Okarma: Assistant Secretary and Assistant General Counsel

Johnson Controls Automotive Systems Group Europe in Germany is the main subsidiary for expansion in Europe. In 1995 a new US\$ 20 million headquarters in Germany will be opened in Burscheid, near Wermelskirchen. The new headquarters will run the entire European automotive systems business, including R&D.³⁴

Johnson Controls also has a coordination centre with a treasury office (6 employees) in Belgium.

³³. Annual Report 1994.

³⁴. Frankfurter Allgemeine Zeitung, September 20, 1994.

7. Strategic Policy

Johnson Controls goes out of its way to please customers by continuously improving quality, service, productivity and time compression.

Essential in the strategic policy of Johnson Controls is that it uses its strong relationships with existing customers so that as they expand around the world, they take Johnson Controls with them.

As a global seat supplier Johnson Controls tends to locate seat plants close to its customers assembly plants for quick delivery.

Just-In-Time delivery is an important feature. For example, Johnson Controls was (among other reasons) chosen as supplier of seats and headliners in the **Mercedes** project in the US because of its reputation for quick delivery. Bob Birch, vice president of purchasing and logistics for the Mercedes-Benz project, said: "Johnson Controls is a world-class supplier with a proven record of superior program execution... We're building strong relationships with companies like Johnson Controls that can meet our quality, cost and time targets." Johnson Controls will produce and deliver the headliners in sequence to the Mercedes assembly line. Lou Senunas, general manager of Interior Systems of Johnson Controls, said: "Every hour, we'll be delivering 15 fully assembled headliners in the exact order in which they'll be installed. We don't have any room for glitches, since the headliner is one of the first trim components put on the vehicle during the assembly process. Sequenced, Just-In-Time production will work as well for us with our headliners as it has worked with our seat systems."³⁵

Chrysler decided to concentrate on its core business, being manufacturing cars, transmissions and engines. It wants to buy all other components from suppliers. That is why it sold its Acustar seat plants to Johnson Controls, effective June 30, 1994. Chrysler already buys about 70 percent of its parts from outside suppliers, versus about 50 percent at Ford and about 30 percent at General Motors.³⁶

Johnson Controls aims to use the opportunities opened by its customers who want to outsource functions they used to perform themselves. In the controls business, for example, building owners are asking Johnson Controls to take complete responsibility for operating and maintaining their buildings, in addition to providing them with building control systems. In the automotive business Johnson Controls is starting to do much more than just assemble seats or manufacture seat components. The company began to design new advanced complete seat systems, like the Integrated Belt-In-Seat System, and components such as power track mechanisms.

Johnson Controls wants to continue to grow and hold its lead through new facilities and global joint ventures as opposed to an acquisition strategy. Johnson Controls did buy Acustar

³⁵. PR Newswire (Reuter Textline), August 5, 1994.

³⁶. Detroit News, May 25, 1994.

from Chrysler, but says not to have been interested in Fiat's seating facilities, which were sold to its main competitor Lear.

Johnson Controls is investing heavily in the UK, where it plans to double its share of the UK car-seat market of 25 to 50 percent. Currently almost 60 percent of the seats are manufactured by car manufacturers themselves.

Johnson Controls estimates that eventually the automotive seat business will see more growth coming from Europe than the US.

Johnson Controls has a number of environmental litigation and proceedings against the company in the US. Still, in 1994 Johnson Controls won the Pollution Prevention Award for Solid Waste Recycling of the Department of Energy (DOE) for its activities to recycle waste such as batteries, photographic film, tires, waste oil, scrap metal and phone books at its Los Alamos National Laboratory in New Mexico, US.³⁷

³⁷. PR Newswire, May 5, 1994.

8. Financial Performance

In 1994 record sales and net income were booked by Johnson Controls.³⁸ Revenues increased 11 percent, making 1994 the 48th consecutive year of higher sales. The 20 percent increase in net income reflects double-digit profit improvements by all four business groups.

Table 1. Financial results of Johnson Controls, 1990-1994
(in millions of US dollars)

	1994	1993	1992	1991	1990
Net sales	6,871	6,182	5,157	4,559	4,504
Operating income	365	313	274	233	229
Net income	165	16	123	95	92

In 1993 some accounting changes have been made. The combined cumulative effect of these changes was a one time charge of US\$ 122 million after taxes.

Johnson Controls' annual report 1994 has a fitting theme: growth. For 1995 another year of improved financial results is expected by Johnson Controls management. Investment will reach record levels.

Table 2. Financial position of Johnson Controls, 1990-1994
(in millions of US dollars)

	1994	1993	1992	1991	1990
Working capital	262	247	279	271	191
Total assets	3,807	3,231	3,180	2,841	2,799
Long-term debt	670	500	503	491	483
Total debt	714	552	678	733	780

Total debt to total capitalization decreased from 43 % in 1990 to 34 % in 1993. In 1994 there was an increase to 37 %.

Johnson Controls books 4,5 times as much sales in the US than in Europe in 1994. In 1992 this was more than 5 times. See table 3.

Table 3 also shows that operating income in Europe is still very low.

³⁸. Johnson Controls' fiscal year ends September 30.

Table 3. Financial results and position of Johnson Controls per geographic area, 1992-1994
(in millions of US dollars)

	1994	1993	1992
Net sales			
US	5,295	4,751	4,119
Europe	1,172	1,089	798
Other foreign	404	342	239
Consolidated	6,871	6,182	5,157
Operating income			
US	316	283	243
Europe	11	2	21
Other foreign	38	28	9
Consolidated	365	313	274
Assets			
US	2,288	2,061	1,942
Europe	992	722	854
Other foreign	143	118	145
Unallocated	385	329	239
Consolidated	3,807	3,231	3,180

In 1992 the controls business booked higher sales than the automotive seats. Since 1993 automotive seatings book higher sales. In table 4 the results of the business segments is shown.

Table 4. Financial results of the business segments of Johnson Controls, 1992-1994
(in millions of US dollars)

	Sales	Income	Assets
1994			
Automotive	2,874	144	1,285
Controls	2,260	95	929
Plastics	998	72	722
Battery	738	55	463
Unallocated			408
Consolidated	6,871	365	3,807
1993			
Automotive	2,556	128	1,028
Controls	2,040	84	732
Plastics	900	62	687
Battery	685	39	454
Unallocated			329
Consolidated	6,182	313	3,231
1992			
Automotive	1,701	84	999
Controls	1,948	84	779
Plastics	818	66	693
Battery	689	41	470
Unallocated			239
Consolidated	5,157	274	3,180

Sales = Net Sales; Income = Operating Income; Assets (Year End)

Johnson Controls automotive seating systems have experienced rapid growth in the last few years. Net sales increased from 1,701 million US dollars in 1992 to 2,874 million dollars in 1994.

Automotive seating sales and operating income both grew by 12 percent in 1994. Johnson Controls expects seating sales to increase by 20 to 25 percent in 1995. Further improvement in operating income is expected for 1995, too, as a result of higher sales revenues and cost reductions. The cost reductions will be the result of continuous improvements in quality and productivity.

Sales in the controls business rose 11 percent in 1994; operating income rose 12 percent. For 1995 an increase in sales of 10-15 percent and higher operating income are expected.

In 1994 sales in the plastics business rose 11 percent due primarily to higher unit shipments; operating income rose 16 percent. For 1995 sales are expected to increase 10-15 percent due to higher sales of non-soft drink containers, growth outside the US, etc.; operating income will rise as well.

Sales in the battery business increased 8 percent in 1994, the first increase in three years. Operating income rose 41 percent, due to continued increases in operating efficiency and strong sales of higher margin premium batteries. For 1995 sales are expected to decline 10-15 percent because of the loss of Sears, Roebuck and Co. Operating income will decrease as well.

James Keyes, Johnson Controls' Chairman and CEO, said: "We're confident 1995 will be the 49th year of sales growth... Following that, because of the business that we have, we should have earnings growth for the fifth straight year." Keyes also said automotive seating will have annual compounded sales growth of 15 percent or more during the 1994-1997 period. Stephen Roell, chief financial officer, said Johnson Controls expects operating margin at its recently expanded European operations to be near break-even in 1995, versus a slight loss in 1994.³⁹

³⁹. Reuter News Service, November 17, 1994.

9. Conclusion

Johnson Controls is a rapidly and aggressively expanding US-based company. It started with control systems, but nowadays its automotive segment is more important in sales. Other segments are plastic packaging and car batteries. Almost 40 % of its total workforce of 54,800 people is engaged in the automotive seats business. About 30 % of its automotive workforce is based in Europe.

Johnson Controls is building strong relationships with its customers. In the automotive business car producers are outsourcing more of their non-core activities, like seats and headliners. Johnson Controls usually sets up own facilities or joint ventures close to its customers' assembly plants. The company is strong in Just-In-Time supply.

The company is very much dependent on its customers, the car manufacturers. Employees should be very aware of the fact that if the customer moves away, Johnson Controls probably does the same.

Johnson Controls has won major contracts for the coming period. The biggest loss was the contract of its Battery Group with Sears. This loss has led to job losses in the US.

Johnson Controls is targeting Europe for the years to come in its automotive business. The company expects more growth to come from Europe than the US. At the moment the recently expanded European operations still work with negative or low positive operating results. In Europe many automotive seats plants have been opened and some more might follow. At the moment Johnson Controls is creating jobs in Europe. At the end of 1995 probably some 7,500 employees will work in the automotive seat business of Johnson Controls in Europe (versus 300 in 1987).

Appendix:

Johnson Controls and its main subsidiaries (Who Owns Whom 1994)

JOHNSON CONTROLS INC., 5757 North Green Bay	3822, 3622.	
Avenue, P.O.Box 591, Milwaukee, Wi. 5320	1731, 3691.	
Tel: (414)228-1200	3714	
. Controles de Juarez S.A. de C.V.	Mexico	
. Controles de Presion de Ciudad Juarez S.A. de C.V.	Mexico	
. Controles Reynosa S.A. de C.V.	Mexico	
. Fanni F.A.I.N. S.p.A.	Italy	
. Hoover Universal Inc.	U.S.A.	
. . Apple Container Corp.	U.S.A.	
. . Cadiz Railroad Co.	U.S.A.	
. . Ferro International Sales Corp. (d)	U.S.A.	
. . H.U. Italy S.p.A.	Italy	
. . . Uniloy - Comec S.p.A.	Italy	
. . . Uniloy-Moretti S.r.l.	Italy	
. . Hoover Ikeda Inc. (A)	U.S.A.	
. . Hoover International Inc. (d)	U.S.A.	
. . Hoover Universal (Canada) Ltd.	Canada	
. . IAMSA S.A. de C.V. (A)	Mexico	
. . Johnson Controls Automotive N.V.	Belgium	
. . Lapeer Trading Co. (A)	U.S.A.	
. . Setax Inc. (A)	U.S.A.	
. . Technotrim Inc.	U.S.A.	
. . Trim Masters Inc. (A)	U.S.A.	
. Interstate Battery Systems of America Inc. (A)	U.S.A.	
. Johnson Controls International Inc.	U.S.A.	
. . G-U Export Inc.	U.S.A.	
. . Globe International Delaware Inc.	U.S.A.	
. . . Low Beer Controles Ltda. (A)	Brazil	
. . . Nicco Batteries Ltd. (A)	India	
. . . Productos Industriales de Plomo S.A. de C.V. (A)	Mexico	
. . Globe-Union Inc. (Delaware)	U.S.A.	
. . Globe-Union Inc. (Nevada)	U.S.A.	
. . JCI Regelungstechnik GmbH	Germany	
. . JCI Sdn. Bhd.	Malaysia	
. . Johnson Control N.V., S.A.	Belgium	
. . Johnson Controls Australia Pty. Ltd.	Australia	
. . Johnson Controls DISC Inc.	U.S.A.	
. . Johnson Controls España S.A.	Spain	
. . Johnson Controls Export Inc.	U.S.A.	
. . Johnson Controls France S.A.R.L.	France	
. . Johnson Controls Ltd.	Canada	
. . Johnson Controls de Mexico S.A. de C.V.	Mexico	
. . Johnson Controls (N.Z.) Ltd. (A)	New Zealand	
. . Johnson Controls Nederland B.V.	Netherlands	
. . . JCI Regelungstechnik Ges. m.b.H.	Austria	
. . . Johnson Controls Automation Systems B.V.	Netherlands	
. . . Johnson Controls Norge A/S	Norway	
. . Johnson Controls Plastics N.V., S.A.	Belgium	
. . Johnson Controls Products Ltd.	U.S.A.	
. . Johnson Controls S.A.	Switzerland	
. . . Johnson Controls Hong Kong Ltd.	Hong Kong	
. . . Johnson Controls S.p.A.	Italy	
. . . Johnson Controls Systems S.A.	Switzerland	
. . Johnson Controls (S) Pte. Ltd.	Singapore	
. . Johnson Controls Services Ltd.	Cayman Islands	
. . . Johnson Controls Saudi Arabia Ltd. (A)	Saudi Arabia	
. . Johnson Controls (UK) Ltd	U.K.	
. . . Johnson Control Systems Ltd.	U.K.	
. . . . Johnson Control Systems (Pensions) Ltd.	U.K.	
. . . . Paul Carter (Environmental Services) Ltd.	U.K.	
. . . . Uniloy (U.K.) Ltd.	U.K.	
. . . Johnson Controls Automotive (UK) Ltd.	U.K.	
. . . . Harrison & Jones-Naue Group Ltd.	U.K.	
. . . . Ikeda Hoover Ltd. (A)	U.K.	
. . . . JRI Technologies Ltd. (A)	U.K.	
. . . . Johnson Controls Automotive Components Ltd.	U.K.	
. . . . Johnson Controls Automotive Foam Ltd.	U.K.	
. . . . Johnson Controls Plastics Ltd.	U.K.	
. . Johnson Service Co. (Delaware)	U.S.A.	
. . Johnson Service Co. (Nevada)	U.S.A.	
. . Penn Controls Argentina S.A.I.C. (A)	Argentina	
. . St. Thomas Energy Exports Inc.	Virgin Islands (U.S.A.)	
. Lahnwerk GmbH & Co. KG	Germany	
. Pan Am World Services Inc.	U.S.A.	
. . East 60th Street Development Corp.	U.S.A.	
. . Pan Am Computer Systems Inc.	U.S.A.	
. . Pan Am Environmental Systems Inc.	U.S.A.	
. . Pan Am Management Systems Inc.	U.S.A.	
. . Pan Am Metroport Inc.	U.S.A.	
. . Pan Am Security Systems Inc.	U.S.A.	
. . Pan Am Support Services Inc.	U.S.A.	
. . TGS Technology Inc.	U.S.A.	
. Premier Polymer Mouldings Ltd.	U.K.	
. . CH Industrial Properties (d)	U.K.	
. . Curled Hair Ltd. (d)	U.K.	
. VARTA BATTERIES Ltd.	Canada	
. . Agfin Investments Ltd.	Canada	

SOMO
Paulus Potterstraat 20
1071 DA Amsterdam (Neth.)
Telefoon: 020-737515

