

O' mag

[O] THE NTN-SNR GROUP PARTNERS' MAGAZINE N°1



Industry and Automotive

Advancing on all fronts



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a market for the future

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Europe by storm

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a new momentum



editorial



A LEADER FOR THE BENEFIT OF ALL

Mr Sepulchre de Condé,
Managing Director, SNR Bearings.

“One voice to the customer”, a single voice at the service of all our customers, present and future!

As a major player, now rated one of the largest companies in the business, NTN-SNR Group today means 55 plants, 85 sales units, 18 R&D centres, 21,400 employees all over the world and a total income of €3.7 bn... NTN-SNR Group also means the determination to complete our merger rapidly, visibly and concretely for more immediate operability.

As evidence of this determination, by April 7th 2008, the day the Group was effectively constituted, we had already developed an expanded range of products and services with a common price-list, and had unified our technical-sales networks...

By 2009, we will have done the same for our IT systems and logistics.

All these joint actions are intended to serve a single ambition: to meet all your expectations either as a manufacturer or a distributor.

For you, the new NTN-SNR Group will henceforth mean fully developed product ranges, enhanced availability, reactivity and an optimized capacity for listening to and communicating with all our customers.

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AUTOMOTIVE, A MARKET FOR THE FUTURE

CHALLENGES OF THE AUTOMOTIVE OE MARKET

- > N°1 worldwide in OE wheel bearings
- > N°1 in Europe in OE wheel bearings

NTN-SNR Group supplies the world's greatest automobile manufacturers:

- > Toyota
- > General Motors
- > Ford Group
- > Volkswagen Group
- > Renault/Nissan
- > Hyundai
- > Honda
- > PSA
- > Fiat Group
- > Chrysler
- > Suzuki
- > Mitsubishi
- > Daimler
- > BMW
- > AvtoVAZ
- > Iran Khodro
- > Porsche
- > Aston Martin
- > Isuzu
- > Volvo RVI
- > Jaguar...

NTN-SNR Group supplies the world's greatest equipment manufacturers:

- > Gates
- > Bosch
- > ZF
- > Litens
- > Behr
- > Borg Warner
- > Dayco
- > Sanden
- > Valeo
- > Ogura
- > Mobis...

Today's motor vehicles are increasingly complex but also increasingly reliable. To meet manufacturers' requirements, NTN-SNR Group has developed specific ground breaking products and applications, associated with permanent technical and sales reactivity. To find out more, we met with Marc Bernuchon, SNR's OE Marketing Manager...

RESPECTED EXPERTISE

« Now, in the automotive world explains Marc Bernuchon, no component can pass on an in-depth study, however ordinary it may appear. That's why no particular bearing gets special treatment over any other. Each function must respond to special demands and our teams have developed a certain expertise in this area. Advancing vehicle design is what drives us. It's no coincidence that we are today the world's n°1 manufacturer of wheel bearings, with our components used in 8 out of the 10 most popular cars sold in Europe. It's the proof that our expertise is recognized. We know how to combine innovation and precision, reliability and performance. »

A COMPLETE RANGE

« ASB®, which is now the benchmark sensor bearing, is of course a symbol of our spirit of commitment. It has brought real added value to the bearing as a component, and driven car design forward. But the NTN-SNR Group OEM product range is not limited just to wheel bearings. It covers a very wide range of applications:



NTN-SNR Group supplies the world's greatest automobile manufacturers.

- > Bearings for manual and automatic gearboxes
- > Suspension thrust bearings
- > Clutch thrust bearings
- > Bearings for engine applications
- > Bearings for accessories (starters, generators, compressors, distributors etc.)
- > Drive shafts and homocinetic gaskets

We also offer a very complete range of products:

- > Ball bearings
- > Cylindrical roller bearings
- > Tapered roller bearings
- > Needle bearings

A DESIRE TO LISTEN

We are present in all the major markets in Asia, Europe and the Americas, and we are suppliers to the greatest names in the automobile industry, suppliers but also and especially, partners. With each of these manufacturers we seek to develop a close relationship not only technically but also industrially and commercially. It's what marks us out as different, it's what makes us special. »



AUTOMOTIVE AFTERMARKET: EUROPEAN CHALLENGES AND PERSPECTIVES

AS THE CREATOR OF ASB® TECHNOLOGY and world leader in wheel bearings, as a privileged partner of the world's greatest automobile manufacturers, NTN-SNR Group benefits from major advantages in the European aftermarket.

Take a closer look with Jean-Michel Murison, Business Unit Director, Automotive Aftermarket SNR.



320 million private cars and light commercial vehicles is the estimated automobile fleet on the road (2006 figures – Europe, North Africa and Middle East zone).

Estimated growth of the European automobile fleet in 2010:
+10% for the entire European zone.
+20% for Eastern European countries.

A DIVERSIFIED CUSTOMER-BASE...

« The European automotive aftermarket, which also includes North Africa, is an extremely diverse one. Distribution structures vary widely from one country to another. In France, the independent sales network, excluding aftermarket manufacturers, is made up of purchasing centres, groups and independent distributors. In Italy, you have the “ricambisti”, micro-structures that number in the thousands. Conversely, in Germany distribution is essentially handled by a few large European groups (ATR, TEMOT, etc.), each of which supplies thousands of customers. In North Africa, you have independent importers. Finally in Eastern Europe, certain large groups like (see opposite) may have subsidiary units in different countries, and so on. »

A CUSTOMER-CENTRED RANGE...

« So, we have a huge variety of distribution structures, Jean-Michel Murison goes on, and also very diversified vehicle fleets, which require specific product ranges and sales approaches. Overall, there are three zones that can be differentiated by the general standard of living of the people. In richer countries, there is a strong trend towards kits. Actually, consumers who are better off financially prefer to buy kits and replace a full set of worn parts in one go. In less well off countries, price is the determining factor and the demand is more for individual bearings. Emerging markets, and Eastern Europe, where there is still a demand for single bearings, are tending increasingly to go for kits. Given these different needs and expectations, NTN-SNR Group has developed an Automotive Aftermarket range open to both types of product: single bearings or kits. Our impressive presence in the original equipment market, means that NTN-SNR Group can offer aftermarket ranges that are without doubt among the most complete on the market. Judge for yourself! Wheel bearings and kits: 95% of fleet coverage, rollers

and engine distribution or accessory kits: 85% of fleet coverage, single thrust bearings and suspension kits: 90% of fleet coverage... »

(NTN-SNR Group has developed a complete range of “easy to work with” services)

... WITH ADDED SERVICES

« Products and advertising adapted to the market. The managers of our subsidiary unit adapt their sales and marketing policies to suit local requirements. In Germany, for example, the large groups traditionally look for services from their suppliers. So NTN-SNR Group teams go to trade fairs, where sometimes there are a hundred or more distributors showing their products. On the ground, our teams naturally make themselves available to the customers of these distributors, who are often individual garage owners. Direct marketing operations are organized to promote the supplier's products. The large groups also expect technical training for their teams. Though requirements differ according to country, we are noting a strong demand for services everywhere. To meet individual expectations NTN-SNR Group has developed a complete range of “easy to work with” services: electronic or paper catalogues that may sometimes be dedicated, electronic EDI sales aids, sales materials and arguments, technical and sales training, product analyses, tool sets etc. We really provide a lot of tangible resources to reinforce the efficiency of our Automotive Aftermarket distribution networks. »

PARTNERSHIP

METEOR GROUP: GROWTH IN EASTERN EUROPE

AN SNR PARTNER FOR OVER 10 YEARS, Meteor Group is now one of the leading distributors of removable auto parts in Central and Eastern Europe. Created in Hungary in the early 1990s and already established in 6 countries, Meteor is now merging with the German company Trost.

Retrospection in Company of Boaz Kolodner, General Manager Meteor Group.



DAZZLING DEVELOPMENT

« Taking orders, selling and even wrapping packages... during the first two years, everyone had to know how to do everything! » Created in 1992 in Hungary, Meteor was originally just a handful of motivated and versatile employees. However, seeing the vast potential before them, the three founders decided to develop their activities in neighbouring countries... the growth was absolutely astounding!

Meteor established itself in the Czech Republic in 1994, in Slovakia in 1995, in Romania in 1996, in Ukraine in 1998, in Serbia in 2002...

This geographical expansion was accompanied by a development in both the products and services offered. **2004:** Meteor Group joined TEMOT International, an organization with an international market that specialises in buying auto parts.

2006: Meteor Group implemented the concept of the pan-European garage Autofit of TEMOT International in 4 of its markets. The same year, the founding members decided to entrust the management of the Group to a new team.

June 2007: Boaz Kolodner became General Manager and a new era began...

FUSION FOR EXPANSION

1st April 2008: Trost (Eugen Trost GmbH & Co. KG), another member of TEMOT International, accounted for over 50.1% of the Meteor Group capital, and planned to acquire the remaining 49.9% of stocks by 31 December 2009 at the latest.



The same standards of quality, the same integrated system of products and services... The two companies share the same values and are initiating a policy of synergies. With this merger, Trost is committing to a strategic plan for long-term development and is therefore positioning itself as one of the main European players in auto parts.

Taking into account its reputation in its markets, Meteor will keep its name, which is a synonym for quality, commitment, and proximity. The control of operations will remain in the hands of Boaz Kolodner, who fully intends to maintain this path of excellence: « For over 10 years, SNR has accompanied our company, which has only been in existence for 15 years. Today, the NTN-SNR Group remains one of our preferred suppliers because it is, notably, the world leader in original equipment wheel bearings and because more than ever, we are extremely attached to the quality of the products we offer. »

METEOR GROUP, KEY FIGURES:

- 66 outlets
- 1 000 employees
- €65 million: forecast sales for 2008

TROST, KEY FIGURES:

- 62 outlets
- 1 800 employees
- €430 million: forecast sales for 2008

automechanika FRANKFURT 2008



AN UNMISSABLE EVENT

Since its début in 1971, Automechanika Frankfurt has developed into one of the world's most important meeting places for decision-makers in the automotive sector.

The 2006 figures bear this out: 300,000 sqm of exhibition space, more than 4,500 exhibitors 80% of whom were from abroad, 160,000 visitors including 40% from, in particular, France, Great Britain, Eastern Europe, the Middle East and Asia.

Running from 16th to 21st September, the 2008 Automechanika Frankfurt will be exceptional in more than one way... The Automechanika, which is held every 2 years, will be celebrating its 20th birthday this year. This year's theme is: "Global warming and its consequences for automotive professionals".

NTN-SNR GROUP ALONGSIDE OUR EQUALS

For the first time, the NTN-SNR Group stand will be located in Hall 2 (stand B42), the main exhibition hall. The Group will thus take its rightful place among the major bearing manufacturers. This is real recognition, as the presence of any new "entrant" in the main hall is subject to acceptance by the exhibitors already in place.

There'll be a lot to see on the NTN-SNR Group stand: bearings and wheel kits, rollers and distributor kits, brake discs, thrust bearings and suspension kits, compressor and A/C bearings, gear-box bearings and clutch thrust bearings and so on. And lively teams to talk to!



To find out more:
www.automechanika.com

exhibition

TECHNOLOGY

THE ASB® (ACTIVE SENSOR BEARING) SUCCESS STORY



ASB® wheel bearing with sensor-holder and sensor.



ASB® bearing with assembly instructions and protective cover.



Exploded drawing of an ASB® bearing.

DID YOU SAY ASB® ?

ASB® (Active Sensor Bearing) allows active measurement of wheel speeds. The wheel bearing is fitted with a sealing gasket integrating a multipolar ring that, in rotation, is capable of activating an adjacent active sensor attached by clips. The sensor delivers a digital signal as soon as it starts rotating.

ASB® IS A GROUNDBREAKING CONCEPT patented by SNR, that provides precise measurement of wheel speeds. In a little over 10 years, this mechatronics-based technology has become a reference for all the major automobile manufacturers worldwide. Better yet, its development, which is by no means over, has opened up a multitude of new possibilities for the automobile world. ASB® today is a mature technology that is asserting itself as the new growth aftermarket. Let's take a closer look...

ASB®: A WORLDWIDE SUCCESS

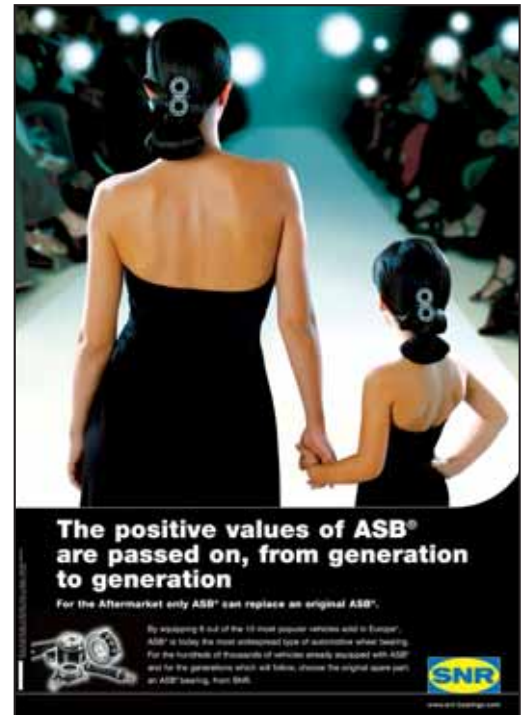
Today, most new European vehicles are fitted with ASB® bearings. In Japan the use of these new bearings is becoming generalised. This worldwide success is linked to 3 essential characteristics:

- > ASB® is a compact and economic solution that gives entry level vehicles high performance equipment that up to now has mostly been reserved for top of the range vehicles.
- > ASB® is a groundbreaking technology that procures considerable progress in regard of automobile security and comfort: ASB® has, for example, simplified the implementation of hill start assist mechanisms.
- > Because of the choice of an open standard strategy, ASB® is produced by bearing and sensor manufacturers across the world.

(most new European vehicles are fitted with ASB® bearings)

ASB®: A HIGH POTENTIAL INNOVATION

The mechatronics concept of speed sensor bearings is just the beginning. On the basis of this initial success, NTN-SNR Group is also developing full systems. With ASB® 2, both the speed and the position of the wheel can be measured. A third generation - ASB® 3 - will enable the measurement of stresses passing through the wheel bearing. Other work allowing the integration of diagnostic functions is already nearing completion. These developments aim to meet the needs of the railway sector (onboard axle box diagnostics, see p.15), industry (monitoring of continuous process machines) and aeronautics (monitoring of helicopter tail rotors etc.).



They will also be used ultimately by the automotive sector to procure a major advantage: autonomy. The concept of the stand-alone smart sensor is based on a microsystem capable of recovering energy (magnetic, vibratory, thermal etc.) dissipated by the bearing, of converting this energy into electricity which is then stored and supplied to the temperature and vibration sensors or other functions. It will communicate data to a central system through innovative very low energy consumption protocols. So wheel speed measurement is only the first step on the innovation trail... The immediate applications generated by ASB® technology are already numerous: braking, steering, suspension and propulsion.

ASB®: IN THE AFTERMARKET

Parallel with these new developments, ASB® is revolutionising the automotive aftermarket. Now produced and fitted as standard original equipment, ASB® is beginning to be generalised among distributors and the garages as an "original replacement part". With more than 100 million ASB® bearings manufactured, SNR has proved its capacity to contribute to automotive progress. Built on human values, yet resolutely oriented towards innovation, SNR successfully combines cutting edge technological expertise with imagination, all in the service of safety.

Find out more:
see "Mechatronics" article on page 14.

MEETING WITH...

The Honda Racing F1 Team.
NTN has been an honored
partner since January 2005.
What's at stake...



Jenson Button, Rubens Barrichello

CLASSIFICATION AND DRIVERS HONDA F1

2000

5th place in champion ship with
20 points - Jacques Villeneuve
and Ricardo Zonta

2001

6th place in champion ship with
17 points - Jacques Villeneuve
and Olivier Panis

2002

8th place in champion ship with
7 points - Jacques Villeneuve and
Olivier Panis

2003

5th place in champion ship with
26 points - Jacques Villeneuve,
Takuma Sato and Jenson Button

2004

2th place in champion ship with
119 points - Jenson Button and
Takuma Sato

2005

6th place in champion ship with
38 points - Jenson Button, Takuma
Sato and Anthony Davidson

2006

4th place in champion ship with
86 points - Jenson Button and
Rubens Barrichello

2007

8th place in champion ship with
6 points - Jenson Button and
Rubens Barrichello

2008

Champion ship in progress -
Jenson Button and Rubens
Barrichello

TO FIND MORE, VISIT:

www.hondaracingf1.com



NTN HAS BEEN ACTIVE FOR MANY YEARS IN GLOBAL AUTO RACING, ESPECIALLY AS AN OFFICIAL SPONSOR OF THE NASCAR CRAFTSMAN TRUCK SERIES CHAMPIONSHIPS, THE CASCAR, AND THE WSA/CSRA SNOWCROSS CIRCUITS. WHEN HONDA MADE THE DECISION TO RE-ENTER FORMULA ONE, NTN SHARED ITS PASSION AND JOINED THE ADVENTURE.

A LITTLE HISTORY

In December 1963, Honda entered Formula One competition with its first F1 prototype, RA270, powered by an experimental 60 degree 1.5 liter RA270E V12 engine.

In 1965, Honda won its first victory with the RA272 at the Mexico Grand Prix.

In 1968, Honda left Formula One racing, but returned in 2000 as the engine supplier for the young British American Racing Team.

In 2005, Honda bought out BAR to establish the Honda Racing F1 Team. Its return as a Formula One car manufacturer coincided with the fortieth anniversary of its first victory!

VALUES WE SHARE

From the very start NTN immediately identified with this new racing team: « high technology, precision, and speed are the fundamental Formula One values explains Kenji Okada, NTN Director and Corporate General Manager at that time. These are the same values we promote in all our products and services... »

Hence was born the Honda Racing F1 Team and NTN partnership, based on performance and innovation. NTN brings its expertise, while its logo and brand ride proudly on the front end of the Honda Racing F1 Team car.

THE TECHNOLOGICAL AND ECOLOGICAL STAKES

For 2008 the Honda Racing F1 Team is leading the way in global environmental protection activities through its earthdreams programme. Earthdreams is a global initiative that is supporting and empowering a range of environmental projects focusing on the themes of mobility, technology, sustainability and education.

NTN recognises the global significance of this project and is proud to be associated with the Honda Racing F1 Team and the earthdreams initiative.

00 DESTINATION EUROPE



NTN-SNR GROUP TAKING EUROPE BY STORM

**MORE THAN
10,5 MILLION SQ KM,
726 million inhabitants,
44 countries,
35 official languages,
225 secondary languages...
NTN-SNR Group has made
Europe, the "old continent"
charged with history,
its prime objective.
First sight of the new
"road map"...**



29,89%

of worldwide Gross Domestic Product (GDP) in 2006.
At US \$14,420 bn, the European Union is the world's leading economic power. It is also the world's leading agricultural, industrial and services power

From the shores of the Atlantic to the Ural Mountains, from the Arctic sea to the Mediterranean, Europe geographically is diverse and multiple. But Europe is also driven by a firm desire for union. Indeed, since January 1st 2007, the European Union consists of 27 member states 17 of which share the same currency in the "Euro zone". This European Union represents the largest economic and industrial power in the world.

THE WORLD'S GREATEST INDUSTRIAL POWER

Numbers don't lie! In 2004, the European Union (EU) effectively generated 29.8% of the industrial added value in the world, ahead of the US (22.4%), Japan (12.1%) and China (7.8%). In 2006, industrial activity represented 18% of the EU's Gross Domestic Product (GDP) and 17.9% of jobs, i.e. 39 million people. With 75% of total exports, industry remains a vital component of the EU's economy.

Because of history, we know that European industry is often concentrated on sectors that are thought of as "traditional": automobiles, agro-foods, metallurgy, chemicals etc. However, contrary to received ideas, these industries are not developing less quickly than certain more recent sectors. For example, between 1997 and 2005, while information technologies, audio-video equipment and the aeronautics and defence industries saw their share of worldwide exports shrink, those of the automobile, chemical and metallurgical industries increased. With a 66% rise, the pharmaceutical industry proved to be the most dynamic sector. Another important fact for the future is that no less than 80% of the investment in R&D in the private sector is attributed to industry.

AN ASPIRATIONAL STRATEGY

Following its new development plan, NTN-SNR Group is focussing on Europe as its primary deployment zone and is making European industry its priority aim. The challenge? 60% growth by 2011 as compared with the benchmark year 2006. The Group is not lacking in assets to take up this challenge. Synergies mean we are benefiting from new resources, both human and technical, across the European continent: 10 plants, 1 R&D centre based in Annecy (France), a network of 18 sales and technical subsidiary units that guarantee close attention to every one of our customers everywhere.

(Europe, a priority deployment zone)

During their 90 years respective existence, the NTN and SNR companies acquired invaluable expertise and experience in the most diverse sectors of activity. From Alstom to Toyota, their references are too many to list. Now with these strengths united, NTN-SNR Group now offers one of the widest product ranges on the market: standard bearings, linear motion guides, special bearings dedicated to industry, automobiles and aeronautics served and developed by a specific European R&D Centre. Soon a unique IT system, shared logistics centres... Together, we are pursuing our effort of optimization, for you. Together, on the ground, on a day-to-day basis, our sales teams are already mobilized around your projects... With ever-wider product ranges and customised services, the NTN-SNR Group is, more than ever, a powerful presence at your side.



ALWAYS ADVANCING!

PARTNERSHIP



KEY DATA AS AT 01/06/08

- > **Production sites:**
Germany, Japan, USA.
- > **Research and development:**
more than 30 engineers in various disciplines.
- > **National distribution sites:**
Micromotion GmbH:
Development and production of micro-reducers and complete systems by LIGA process.
- > **OVALO GmbH HD:**
Mass production of reducers using the Harmonic Drive principle, mainly for the automobile industry.
- > **Verzahnungstechnik GmbH:**
Production of gears and special products.
- > **HD Polymer GmbH:**
Development and mass production of plastic reducers.
- > **16 international sales subsidiaries.**
- > **6 technical subsidiaries.**
- > **Annual worldwide production:**
approximately 300,000 HD reducers.

Find out more:
www.harmonicdrive.de

HARMONIC DRIVE IS A NAME THAT IS OMNIPRESENT in technical drive train circles. For more than five decades, it has been a synonym for quality and extreme precision throughout the world. The point of departure of this now planetary industrial technology was a revolutionary reductor concept, created in the 50s, which has progressively given birth to ever-wider range of products. Early on, some twenty years ago now, SNR became closely involved in the development effort by designing a four-point bearing housing. Since then collaboration between the two companies has continued to develop, and future projects abound...

The cutting edge applications, precision drive trains and high quality transmission systems produced by the company in Limburg an der Lahn, 65 km north-east of Frankfurt am Main, have become indispensable essential elements for many activities all over the world...

A little flash-back: The adventure started in 1955, when Walter Musser, an American scientist, developed a new type of reductor that was fundamentally different from existing components. Initially the revolutionary concept was developed exclusively for NASA. The Harmonic Drive reductor attracted attention in particular because of its unique operating principle, remarkable precision of transmission, absence of play, exceptional performance, service life and reversibility. These unique characteristics, which were constantly being improved on, opened up the possibility of multiple applications in the most diverse industrial sectors, from robotics to medical techniques, from telecommunications to aviation and, of course, space exploration.

For the Harmonic Drive Company, quality is an absolute and permanent imperative from the design stage through to the production of thousands of transmission systems each year. The company has been ISO 9001 certified since 1996. While reinforcing its position of leader in the worldwide reductor market, Harmonic Drive has made customer satisfaction its principal aim. An aim achieved thanks especially to the constant improvement of all its internal resources, an information service managed by in-house engineers and an ultra-efficient customer service department.

1998: Harmonic Drive further optimized its production capacity at Limburg. By investing in the best digitally controlled machine-tools and in dimensional control machines, the company improved both the quality of its products and its delivery times.

In 2006 Harmonic Drive AG took a new step forward by opening its Design and Technology Centre, as a commitment that product development, consolidation of technological advances, competitiveness and success would be unequivocally sustainable.

« SNR and Harmonic Drive have been working together for 20 years now. It all began with the joint development of a bearing housing to be assembled below the Harmonic Drive reductor, combining precise and regular movement sequences with high quality travel. That was how the 4-point bearing housing saw the light of day in the HDGM reductor series. Since then SNR and Harmonic Drive have successfully developed different drive bearing designs to meet the most diverse technical requirements. In the framework of the strategic development of its products, it had become indispensable for the Harmonic Drive unit in Limburg to find a skilled and reliable partner with whom it would be possible to find innovative new development paths over the long term. Consequently, SNR and Harmonic Drive have jointly set themselves the target of taking a leading position in the precision drive technology sector. »



**M. Masanao
KOBAYASHI**

Vice President
& CEO
Harmonic
Drive AG.



CLEAN ENERGY AT THE SERVICE OF THE WORLD

PARTNERSHIP



KEY DATA AS AT 01/02/08

- > **Production sites:**
Germany: Aurich, Emden, Magdebourg.
International: Sweden, Brazil, India, Turkey, Portugal.
- > **Research and development:**
more than 130 engineers specialized in different disciplines.
- > **National sales offices:** 8.
- > **International sales offices:**
in 16 countries.
- > **Customer service:**
more than 160 agencies around the world.
- > **Logistics:**
mobile cranes up to 800 tonnes, hundreds of service and maintenance vehicles as well as several special vehicles for the transport of masts and blades.
- > **Installed power:**
more than 12,500 wind-turbines installed.
Total power: more than 14 GW.

Find out more;
www.enercon.de

IN THE FEW YEARS since engineer Aloys Wobben founded ENERCON in 1984, the company has become a world leader in the field of wind-turbine installations. With more than 50% market share in 2007, the company is number 1 in Germany, its home base. Let's take a look at a success story that SNR has always taken a close interest in... A partnership that will continue to grow and develop thanks to the optimized resources of the new NTN-SNR Group.

So what is the secret of ENERCON's success? As is so often the case, the key lies in a revolutionary concept. In the 80s, wind-turbine installations still operated with gear systems.

In 1991, ENERCON achieved a worldwide first that led to a true technological revolution. In that year, ENERCON built and put into service the first wind-turbines that did not require gears to transmit movement. Instead, the new transmission system relied on an ingenious principle: the smaller the number of rotating elements the weaker the mechanical loads and constraints. Maintenance costs were slashed and the service life of the wind-turbines increased. With an energy flow that virtually eliminated friction, performance and reliability became the hallmark of the ENERCON standard.

From its foundation on this technical innovation, ENERCON has developed specific expertise, with a full range of products and performance recognized all over the world. At the present time, more than 12,500 ENERCON wind-turbine installations are supplying the world with more than 14 gigawatts of power! The clean, renewable power that alone is capable of responding to the challenges we will have to face in the future.

With 10,000 employees and contractors, 8 manufacturing sites not only in Germany but also in Sweden, Brazil, India, Turkey and Portugal, ENERCON is able to offer an extremely large product range. All the products and performance levels are available from a single supplier. Thanks to the "ENERCON partnership concept", availability for the customer is in the order of 97%, including services like maintenance, repair and delivery of spare parts. As an ultimate challenge, ENERCON has produced the E-126 6MW, the largest wind-turbine installation in the world!



« Since 1992, SNR has been manufacturing and marketing bearings for rotors, propeller blades and azimuth drives. The new NTN-SNR Group now figures among our top 3 suppliers in these fields. But the merger between the two companies NTN and SNR represents even more for ENERCON... It means that we can now count on a top-ranking manufacturer who will also be a partner for all seasons. This way, we are sure to benefit from excellent technical skills in research & development. We are also reassured as regards investments in sufficient production capacity to guarantee reliability, and all-in prices that correspond to fair market prices. The SNR Company is already providing assistance in terms of automation, especially in regard of pole shoe windings. Products in the pipeline include bearings for the series E-82, rotor blades and soon the type E-126 wind-turbine. »



M. Oliver SMIDT
Dipl. Kfm (FH)

Director of Materials
Management,
Mechanics Division
ENERCON.



NTN-SNR GROUP AT INNOTRANS 2008

NTN-SNR GROUP: COMPLEMENTARITY AT YOUR SERVICE

At the INNOTRANS 08 the new Group NTN-SNR presents in an impressive way the complementarities of both partners. The combined group can now serve the entire rail industry in all applications:

- > Journal bearings with or without sensor with Tapered or Cylindrical Roller bearing design
- > G-box bearings Cylindrical and Tapered Roller bearings
- > Traction motor bearings with or without insulation - Deep Groove Ball, Cylindrical roller, or 4 Point ball Bearings

NTN-SNR Group a true partner for the rail industry, now and in the future.

INNOTRANS IS THE BIENNIAL INTERNATIONAL VENUE for rail transport engineering, and this year it will take place from 23rd to 26th September at Berlin Messe. Apart from NTN-SNR Group proudly showing their expanding product offering, this is the ideal opportunity to take a look at the various products and services behind this booming market.

INTERNATIONAL REFERENCE

In a survey carried out by an independent institute, 95% of trade visitors felt that their visit to the last Messe was "positive", both as regards discussions and commercial results. They also had a high opinion of the products on offer and 9 out of 10 said that they intended to come back next time. Attendance at this year's InnoTrans looks likely to be more international than ever, both in terms of visitors and exhibitors. In addition to the traditional European "rail countries", countries from around the world - including the Near East and Asia - will also be present.

AT A GLANCE

InnoTrans provides a unique view of all sorts of rail transport – passenger, freight, long distance, urban and others. All major sectors that will be present, including: rail technology, interiors, public transport, infrastructure and route techniques, and tunnel construction. A unique feature of InnoTrans is that many of the rail vehicles are on display on a 2 kilometre length of track next to the exhibition halls. In parallel to the fair, the InnoTrans Convention will be offering various forums sponsored by prestigious institutions bringing together decision-makers from around the world to discuss topical issues.

NTN-SNR GROUP SHARING YOUR KEY ISSUES

NTN-SNR Group will be on an 80m² stand proudly presenting the Group's latest products in the ever expanding product range.

Multi-national teams will be available to welcome you and answer all your questions. The star of the show will be the bearings used in achieving the world rail speed record. The key issues which make NTN-SNR Group a real partner for the rail industry are:

- > **Quality and safety:** in Japan and Europe, NTN and SNR have both been involved from the early stages of the development of high speed trains and they continue to design and manufacture bearings to the highest industry standard.
- > **Global product range:** the NTN-SNR Group is present in all major rail applications, with bearings and axle-boxes for all types of trains; high speed, intercity, freight, underground and tramways – complying with EU, US and Asian standards.
- > **Research & Development and Test Centres:** comprehensive and well equipped in Japan and Europe.
- > **Innovation:** new products from the Mechatronics line as well as insulated bearings for motors,
- > **Customer closeness:** NTN-SNR Group has fully dedicated and experienced rail sector teams providing the best service to customers.

5 good reasons to come and meet us at InnoTrans:

Hall 21B - Stand 223

"Innovation for your safe future" is our priority at NTN-SNR Group.



To find out more :
www.innotrans.com



THE WAY AHEAD FOR RAIL



DID YOU KNOW?

“CALCULATE THE IMPACT OF YOUR TRAVEL ON THE ENVIRONMENT”

Now you can, without being a mastermind...

Ecotravel comparators are easily found on the Internet. These tools propose different approaches, both as regards the mode of travel and the ecological impact of your trip. For example, the calculation method developed by experts from ADEME, the French Environment and Energy Control Agency, lists no less than ten modes of travel from walking to driving, as well as travelling by bike, bus and train etc. For each of them, the site assesses three factors: cost, energy consumption and greenhouse gas emissions. Take the time to “eco-compare”. The results are amazing and extremely enlightening.

<http://www.ademe.fr/calculateur-eco-deplacements/>



WILL THE RAILWAY, first invented at the start of the 19th century, and the true locomotive of the industrial revolution, continue to find favour with travellers in the 21st?

Clean and inexpensive, increasingly comfortable and innovative, rail transport has no lack of appeal for future travellers...

THE GROWTH IN TRANSPORT: FACTS AND FOREBODINGS

In a century and a half, the volume of goods traded across the surface of the globe has been multiplied 1,000-fold! It's a dizzying perspective, and the movement is, it seems, certain to develop and accelerate further. It is estimated that worldwide seaborne container traffic will double again over the next twenty years, as will road and air traffic... Though it may be an element of progress, this exponential growth in trade is not consequence-free... We all know by now that fossil fuel resources are limited. In the face of everincreasing demand, oil prices are soaring and reserves are running down. There are other major repercussions, including the ecological impact. According to the United Nations environmental programme, the transport sector in Europe is responsible for 21% of total greenhouse gas emissions, above all CO₂, 92% of which is generated by road transport.

THE ADVANTAGES OF RAIL

The constant increase in international and local traffic, both freight and passengers, energy and ecology concerns... in this new context, rail transport has undeniable advantages which make it unique and which justify renewed interest. In terms of energy consumption, rail is a sparing and inexpensive means of transport. As a comparison, one kilo of oil equiva-

lent enables a high-speed train to cover 172 km, whereas an aircraft can only fly 18 km. Nearly 10 times less! Ecologically, rail transport is among the least polluting forms of travel.

For example, in intercity travel, a car emits about 180g of CO₂ per km. With the train, CO₂ emissions fall to 36g/km ! Of course, we also see the same spectacular difference in freight transport. de marchandises.

(Rail, transport that is both economical and ecological)

Depending on its load capacity, a heavy goods vehicle emits 50 to 180g of CO₂/tonne/km. Trains generate only 20g of CO₂/tonne/km. Increasingly widespread “rail-road” transport systems combine the low consumption of rail and the flexibility of road, producing CO₂ emissions in the order of 40g/tonne/km. This is why it is becoming one of the solutions preferred by many countries. In Europe, road traffic is estimated at 1,500 billion tonnes per km. The European Union's Marco Polo (2007-2013) programme aims to turn this around by promoting new solutions like intermodal transport, where containers are transferred simply and quickly from one mode of transport to another. A field where rail has a major role to play... As the subject of constant and continuing research and development, rail transport looks to have a promising future: environmentally sound, energy-efficient, comfortable and ever more functional.



"Team Building" session between NTN and SNR.



Éric Pommeret (SNR) /
Volker Stienhans.

NTN and SNR: stronger together

"ONE VOICE TO THE CUSTOMER" IS THE WATCHWORD THAT IS GALVANISING NTN-SNR GROUP'S NEW EUROPEAN SALES FORCE. TO LEARN HOW TO SPEAK WITH ONE VOICE, SALES TEAMS FROM THE TWO COMPANIES GOT TOGETHER AROUND A COMMON PROJECT: "GETTING TO KNOW EACH OTHER BETTER TO SERVE OUR CUSTOMERS BETTER". FEEDBACK ON THE "CROSS-TRAINING" AND "TEAM BUILDING" APPROACH THAT AIMS IMMEDIATELY TO OPTIMIZE EFFICIENCY...

« **IN THE NEW SALES ORGANISATION**, explains Eric Pommeret, we are all going to have to represent both brands. To simplify this issue, we have drawn up a complete action plan that was put into operation at the start of 2008 and that will be pursued through 2009. In the context of this plan, the training and team building sessions were undoubtedly key elements. Organized on a country-by-country basis, these sessions are designed to bring together all the technical and sales teams of the NTN-SNR Group in Europe, a total of nearly 500 people: application engineers, sales engineers, sales assistance and so on.

ON THE TRAINING SESSIONS PROGRAM: a detailed presentation of the two companies, their product ranges, common working rules and processes... The method? During these sessions, NTN managers train SNR teams and vice versa. During the "Team Building" sessions, participants are invited to construct a portrait of their opposite number. Participants then work in small NTN-SNR teams of 3 to 4 people, to build a bridge or paint a fresco symbolising the alliance and success of the new NTN-SNR Group teams. To round things off a group discussion is organised about the conditions for good communication as the guarantee of authentic cooperation.

The first sessions, which have already taken up nearly 40 days, along with evenings for further exchanges, have been the subject of a general

analysis and will be followed shortly by further, more in-depth technical training.

A new stage is opening to prepare the future by defining the common skill standards that will enable us to assess our long term technical and sales training needs more precisely, within the framework of a "Technical School" and a "Sales Academy".

First lesson of this year 2008: everyone sees the merger of NTN and SNR as highly motivating, reinforcing the brands in the service of the customer. »

MAIN DATES SEPTEMBER TO NOVEMBER 2008

Fenasucro - September 2nd to 5th
Sertaozinho (Brazil)

Electra Mining Show - September 8th to 12th
Johannesburg (South Africa)

Motek - September 22th to 25th
Stuttgart (Germany)

International Fair Plovdiv
September 29th to October 4th
Plovdiv (Bulgaria)

TIB - October 7th to 11th
Bucharest (Romania)

Airshow China - November 4th to 9th
Zhuhai (China)

EMAF - November 12th to 15th
12th International Exhibition of Machinery,
Tools and Accessories - Porto (Portugal)

INOTECH - November 16th to 18th
Aurillac (France)

trade fairs & exhibitions

» EYE-WITNESS

VOLKER STIENHANS
SNR sales engineer

« Our first technical session was held in March 2008 in Düsseldorf.

For one day, we were taught by NTN application engineers. Our group, who were all specialists in roller bearings, rapidly focussed on some very specific technical points.

Initially, we looked especially at the diversity of the sealing systems for radial contact ball bearings, the choice of materials for different roller bearings, optimising product service life and some exciting manufacturing possibilities: from miniature bearings to the largest roller bearings.

Then came a presentation of the technology of very high precision NTN bearings that supplement our own MachLine range. This session put the emphasis on needle bearings that are opening up new markets.

Though the day was too short to take in everything in the smallest detail, it certainly allowed us to get the measure of the strength and diversity of the NTN-SNR Group. As a result we were able to develop our understanding so as to be able to respond as experts "with a single voice" to the expectations of our customers and build fruitful partnerships, among ourselves and with them. »



MECHATRONICS, A NEW MOMENTUM

MECHATRONICS: PROFILE AND KEY NUMBERS

80 000: that's how many ASB® units are produced every day by SNR. ASB®, the Active Sensor Bearing, or smart wheel bearing, integrates a magnetic crown into the sealing gasket that is used to give a precise measurement of the rotation speed of automobile wheels.



100 million ASB® bearings. Launched on December 16th 1996, production of ASB® bearings passed a symbolic landmark at the start of 2008: the production of the one hundred millionth unit. ASB® was the 1st mechatronics application developed by SNR.



NTN and SNR have for many years been trailblazers in mechatronics.

Today, within the new Group, they are putting their skills together, associating their R&D resources and reaping the harvest of their complementary experiences to invent tomorrow's products. Challenges and perspectives...

MECHATRONICS: FORGING LINKS THROUGH AN ALLIANCE OF TECHNOLOGIES

« From the beginning, mechatronics has been a meeting point between our two companies », said SNR Managing Director Didier Sepulchre de Condé recently. How better to express the strategic importance of mechatronics at the heart of the new NTN-SNR Group. Just a reminder: mechatronics was born of an alliance between mechanics, electronics and information technology. As early as 1984, SNR registered the first patent for the ASB® Active Sensor Bearing, a new design of bearing with an onboard sensor that could give a precise measurement of the rotation speed of automobile wheels. On their side, NTN started work on mechatronics at the beginning of 1990. In 1996, SNR started production of the ASB® which very quickly became the worldwide standard. On the basis of this success, SNR developed ASB® 2, a technology to measure angular position, then ASB® 3, a wheel bearing with an integrated stress sensor.

Today, the NTN-SNR Group is bringing new momentum to this commitment and is making mechatronics one of its core development strategies. This is especially important insofar as the Group benefits from a very favourable environment. The Haute-Savoie region where SNR's head office is located in France has been designated a "European mechatronics

hub". It is technically twinned with "Kagawa University", located next to Osaka where NTN's Japanese HQ is based.

EXCITING NEW DEVELOPMENTS IN PERSPECTIVE...

In fact, important synergies have already been identified around a number of projects: the absolute angle sensor with measurement on power up, a stress sensor used to improve chassis stability, or a bearing with onboard diagnostics functions...

(a technology with immense potential, mechatronics opens up a multitude of new applications)

As one example among others, the "high resolution rotative sensor bearing" is emblematic of the collaborative energies that we are tapping into within the Group. Thanks to NTN's multiple integrated technologies, this new generation bearing benefits from a very compact configuration relative to standard products.

Developed using SNR sensor technology, this bearing improves detection capacity in rotation by more than 40 times. Intended especially to optimize high-resolution colour photocopiers, this product procures energy savings on all rotating equipment.

A technology with immense potential, mechatronics opens up a multitude of new applications, in automotive and in industry. With our shared expertise, the NTN-SNR Group will be at the cutting edge in all these new fields of investigation.

APPLICATION / METHODOLOGY

SNCF + SNR = SCORE

THE AIM OF THE "SCORE" project (from the French acronym for Bearing Unit Operational Monitoring System) is to rethink the operational monitoring and diagnostics of the behaviour of axle boxes on high-speed trains. The solution under study has been specifically designed for rail traffic. Franck Penisson of the SNCF explains.



« To be precise, says Franck Penisson, I'm the Assistant Manager of the "Bogie bearing unit mechatronics centre". We are based at the CIM Rolling Stock Engineering Centre, and we are a major technical group attached to the Rolling Stock Division of the SNCF. Now you know who we are, let me tell you what we do.

Currently, the operational safety of axle bearings is ensured by a network of hotbox detectors installed alongside the track. This fixed trackside system with infrared sensors does not provide analysis of, or anticipate, the behaviour of bogie units in service.

That's why the SCORE project was launched in mid-2007, with a triple aim:

- > To respond to legitimate safety concerns as regards people and equipment by detecting and quantifying failures in axle box bearings as early as possible.
- > 2- To reduce operating and maintenance costs by identifying and changing faulty units in good time thus eliminating costly track stops.
- > 3- To respond to new European standards requiring the use of onboard diagnostics systems for axle box bearings.

To carry out this project correctly we needed SNR, as much for their mechatronics expertise and their experience of rail traffic, as for their technical approach based on detailed knowledge of bearing applications. It's that our approach is original in that we are not content to implement an existing product but rather prefer to define a specifically rail transport solution. In effect, the rail/wheel steel on steel contact induces particular phenomena that we have taken into account for the definition of our sensor bearing.

The first step is the selection of the appropriate sensor types. Of course we looked closely at existing technologies: speed, temperature and vibration measurement. In a wider perspective, we also made our selection as a function of our very specific application and of the data to be obtained. « Which sensors? Where should they be positioned? How would they be integrated? How should the data be processed and used? » We looked at all these questions in-depth with SNR. The final aim was to obtain a real "diagnostics terminal" adapted to our very specific needs, such as for example the estimation of the "life expectancy" of the bearing. The results of this approach are very promising. Prototypes are already in the validation phase, in fixed stations on SNR test benches. In the autumn, we will move on to scale 1, on track on the network with an initial set of four sensor-equipped axle boxes being assembled on a high-speed train. The final conclusion can be expected by mid-2010 after the necessary analysis of an experiment that will cover more than a million kilometres... »

SNR bearing test bench.



Bogie double-deck TGV motor unit.



COUNTERFEIT PRODUCTS



NEW CAMPAIGN WITH SAFE GROUP, THE ANTI-COUNTERFEITING UNION

« A quality product will always have more value than its copy. » Yesterday within the G6, today with the Safe Group, SNR continues to invest in the combat against fake products. Some basic facts...

In 2004 several major automotive equipment manufacturers decided to unite together with commitment and determination in order to combat counterfeiting. They created a group initially designated G6, which in 2008 became SAFE GROUP. With the new name, came a new publicity campaign. For SAFE GROUP the combat against fake products consists not only in raising awareness of the dangers of this problem among stakeholders, but above all in explaining the value and importance of our products and services to:

- > the authorities: economic, regulatory, customs and excise, legal
- > professionals: manufacturers, distributors, wholesalers, dealers
- > consumers.

SAFE GROUP promotes awareness of the specific qualities of original products and of the services supplied by the networks. Original products procure decisive advantages for their customers over counterfeit products. But the combat also has to be waged on the ground with appropriate secure labelling, identification and control systems, confiscation and legal action.

The final goal is of course to provide better protection for drivers and other end users.

Find out more: www.safegroup.fr

ENERGY DERIVES FROM KNOWLEDGE

DOC.G_OVAG_1.GBa

Renewable energies – a growing market which has been and continues to be greatly influenced by the dynamic momentum of ENERCON's future-orientated technologies. Vision, the spirit of research and the courage to achieve innovation are the basis of ENERCON's past and future success.