Press Release

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Already in the test phase with major European vehicle manufacturers

NTN-SNR innovates by proposing reversed tapered bearings at the service of motor vehicle performance

NTN-SNR presents reversed tapered bearings for the motor vehicle industry. This innovation, which was initially designed for gearboxes also has applications in other fields, such as wheels in particular. This type of bearing reduces torque loss and hence helps to cut CO_2 emission levels. NTN-SNR is now proposing this type of bearing for motor vehicle application projects that have stringent requirements regarding energy savings, service life and resistance to degraded conditions. This patented innovation enhances bearing performance levels, and it has also led NTN-SNR to develop its industrialisation processes to provide mass production for the market. The bearing is currently in the study and test phase with major European vehicle manufacturers.

New patents for a high-efficiency industrial solution

Process and improvements

The concept of reversed tapered bearings has been around for a long time: it involves reversing the position of the functional thrust collar holding the rollers in place by putting it on the outer ring rather than the inner ring. As compared with its existing standard model, NTN-SNR has made major optimisation changes as part of a continuous performance improvement procedure. NTN-SNR has applied to patent several design aspects, and in particular the groove geometry and form, together with the cage design. This progress has led to major improvements in the fields of torque reduction, enhanced load-bearing capacity, lubrication and resistance to overheating. Moreover, these innovations, and especially the cage design, have created solutions enabling industrialisation of mass production and hence optimizing the conditions for marketing the bearings. The cutting-edge technique, which has already been tried and tested by NTN-SNR in the aeronautical field, is now available for the motor vehicle industry, for the first time.

The advantages of reverse bearings

- **Reduction of torque and friction losses**

Optimisation of the contacts between the rollers and the outer ring reduces unwanted friction between the rollers and the thrust collar, and hence cuts energy consumption levels. Torque reductions of over 10% have been recorded during the test phase.

- **High load-bearing capacity**
  The internal geometry of the bearing enables enhanced load-bearing capacity for a given overall size, and in particular its radial load-bearing capacity, which can increase by 10 to 30% depending on the reference.

- **Improved heat dissipation**
  A virtuous cycle is implemented during operation: the heat generated at the point of contact between the roller and the thrust collar is evacuated directly into the housing; this reduces the temperature in the bearing. Moreover, the residual temperature rise expands the outer ring, which releases the internal bearing preload and reduces the risk of seizing.

- **Enhanced performance with low lubrication levels**
  The functional thrust collar placed on the outer ring better retains the lubricant, which is forced out onto it by centrifugal force. Bearing service life is thus enhanced under conditions involving low lubrication levels.

Innovation to meet new motor vehicle requirements

All these characteristics meet the most stringent requirements currently set forth by motor vehicle manufacturers. Design work and tests for various applications are in progress with several major European motor vehicle manufacturers, who are showing interest in reverse taper bearings. *"This innovation stems directly from our research programme covering torque reductions and cutting CO_2 emission levels. It now enables us to propose an offer that meets the requirements of the biggest motor vehicle manufacturers concerning reliability and impact on the environment, a theme much talked about today. After the PCS Hub Joint*, which won an award last year at the French Équip'Auto motor show, this new development again highlights our ability to further our development by relying on a constant process of innovation, at the core of our strategy",* said Christophe Ulrici, Original Equipment Automobile Director at NTN-SNR.

* The PCS Hub joint is an NTN-SNR innovation. Thanks to a system of carefully adjusted splines, it helps to improve the link between the transmission and the bearing, with considerable weight savings and a reduction in overall measurements for a given power rating.

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NTN-SNR ROULEMENTS, with its head office in Annecy (Haute-Savoie, France), belongs to the Japanese group NTN Corporation, one of the world leaders in bearings. NTN-SNR ensures the management and development of all NTN activities for the EMEA region and Brazil. A major player as a designer, developer and manufacturer of bearings and sub-assemblies for automotive, industry and aeronautics, NTN-SNR offers a comprehensive range by also developing maintenance services and solutions. NTN-SNR employs 4,225 people at 9 production sites, including 6 in France, as well as 18 business representations.

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