Brand of **NTN corporation**

WHEEL SPEED SENSORS

HISTORY

In 1997, SNR launched a new technology on to the market called ASB® (Active Sensor bearings).

This technology allows the replacement of the older passive technology with a new «active» technology consisting of a new type of bearing seal which has an integrated magnetic encoder. The new seal has a very precise succession of North and South magnetic poles built into the seal that deliver a digital signal that corresponds to the wheel's rotational speed.

The vehicle's ECU uses this information to operate many of the vehicles systems such as ABS, ESP, hill start assist, etc. ....

This solution offers many advantages:

- Signal detection at low speed
- Integration of the magnetic ring in the bearing seal: compact system
- Reduction in the number of parts: simplified wheel assembly
- More accurate reading of the information
- Standardisation of components

Using its it years of experience NTN Europe is developing an ever growing range of products including an extensive range of wheel speed sensors.

SENSOR MARKET

Speed sensors are a growing market. Today, more than 92% of vehicles on the road have wheel speed sensors fitted. A vehicle contains between two and four such sensors, in most cases they are mounted in front of the wheel bearing. All generation 3 of generation 3 bearings are equipped with this technology, which requires 4 sensors per vehicle.

Other factors influencing the market are:

- Stability control (ESP) which has been mandatory since September 2011 in the USA and take since out the end of 2014 for instead of in EU member states.
- The strong growth of ABS and ESP systems over the last 10 years in developed countries and the similar growth in emerging markets such as China, India and Brazil.
- The global wheel speed sensors market was valued at USD **1473.7 million** in 2020 and is expected to reach USD **2625.3 million** by the end of 2027, growing at an estimated rate of 7.9% between 2021-2027.

WHAT DOES A WHEEL SPEED SENSOR DO?

The wheel speed sensor supplies much of the infomation required for the embedded systems in a modern vehicle to function correctly.
The sensor reads the speed of the wheel via the magnetic encoder seal, or from a tone wheel attached the bearing or drive shaft on older vehicles.

In newer vehicles, wheel speed sensors transmit the wheel speed information to many other systems in the vehicle, such as dynamic control.

CAUTION!
LOSS OF THE ASB® SIGNAL CAN HAVE SERIOUS CONSEQUENCES

The ABS warning light on the dashboard will illuminate if the ABS system is no longer functioning correctly. It can not be guaranteed that the anti-lock braking system and vehicles stability control will function correctly during braking.

ABS
Helps prevent the wheels from locking up during sudden emergency braking, and reduces stopping distance while maintaining controlled steering response

NAVIGATION
Even inside a tunnel, without a satellite signal, the ASB® makes it possible to calculate your position on the map.

ESP
Helps the vehicle maintain its stability under heavy braking or slippery conditions

HILL-START ASSIST
Stops the vehicle rolling backwards when pulling away on an incline

ASR
Regulates the vehicles acceleration to help prevent the loss of traction

ACC
Allows the vehicle to maintain a safe distance from the vehicle in front when the cruise control is in operation.

SPEED
The speed of the wheel is used by the vehicles ECU to display the vehicles speed on the dash display.

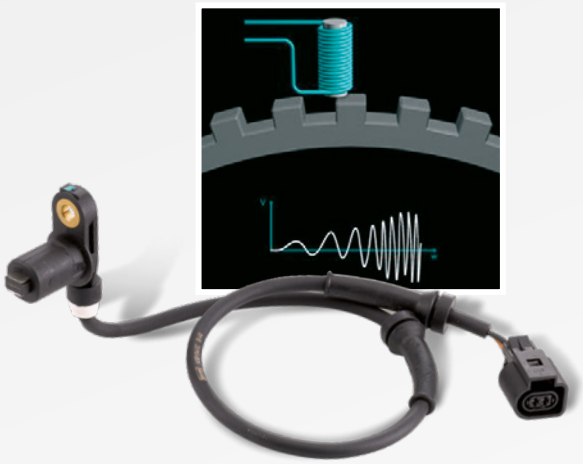
PARK ASSIST
Enables the vehicle to park without the driver's intervention on the steering wheel.

AVAILABLE TECHNOLOGIES

PASSIVE SENSORS

A toothed wheel (abs ring or tone wheel) is attached to the wheel bearing or driveshaft.

The sensor consists of a coil wound around a magnetic core and a permanent magnet. When rotating, the teeth of the wheel generate a magnetic field whose frequency gives the rotational speed of the wheel. This technology does not allow detection at very low speeds, nor does it allow detection of the direction the wheels are travelling. Passive sensors are only used in conjunction with toothed wheels (abs ring or tone wheel).



ACTIVE SENSORS

The main advantage of active technology is that the signal has a constant amplitude even at low speeds. This allows for a more precise use of the speed signal and a better operation of all the systems linked to this signal.

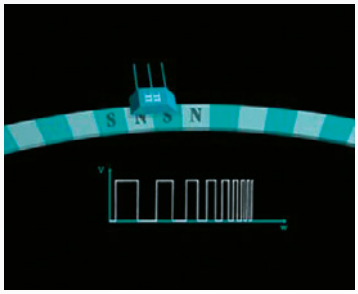
Active sensors are mostly used in conjuction with a magnetic encoder (located on the wheel bearing): ASB Technology®. Some active sensors are also used with the older type of toothed wheels.

There are 3 different types of active sensors

- **ACTIVE HALL EFFECT SENSOR:**

  The sensor consists of a semiconductor coupled to an electronic circuit. This produces an alternating current. The electronic part of the sensor converts the analogue current signal into a digital signal.

NORTH AND SOUTH POLES



- **ACTIVE HALL EFFECT SENSOR ARE USED IN CONJUNCTION WITH A MAGNETIC ENCODER SEAL:**

  The magnetic field is produced when the north and south poles of the encoder rotate in front of the sensor (take all highlighted parts out). The toothed wheel is replaced by a magnetic encoder.

- **ACTIVE MAGNETO-RESISTIVE SENSOR:**

  This technology allows for signal detection where the sensor is further away from the encoder.

WHEN TO REPLACE THE WHEEL SPEED SENSOR?

If the sensor becomes faulty, the ABS warning light appears on the dashboard. A faulty sensor can also cause the ABS system to activate when the vehicle is under normal braking conditions.

When a fault is detected in the ABS system, in around 80% of these cases it is due to a sensor fault.

FAILURE PROBLEMS

The wheel speed sensor is not a part that wears out, it normally fails due to age or damage, failure of the sensor can bring a vehicle to a standstill. As part of security it is essential to be able to supply a quality part and in the shortest time.

Due to their position, sensors are very exposed to external influences, such as water, dirt and general road debris. NTN Europe offers products that have been tested and proven to withstand the harshest of conditions.

There are many causes of failure.

OUTSIDE

- Debris on the sensor
- Damage to the wiring
- Direct damage to the sensor
- Water ingress
- Damage during installation/removal

INSIDE

- Coil failure
- Bad connections on the wiring
- Electronic chip faults

CAUTION!

THE WHEEL SPEED SENSOR IS A **SENSITIVE** COMPONENT

It must be handled with care, as it can be easily take be out damaged whilst changing the wheel bearing.

THE WHEEL SPEED SENSOR IS A **SAFETY** CRITICAL DEVICE

A faulty ASB® signal provides incorrect information, resulting in:

- Incorrect activation of the ABS system, which may affect the vehicles handling.
- An incorrect speed reading from one of the wheels : means the ESP system may not function correctly causing the vehicle to become unstable.
- An incorrectly displayed speed on the vehicles display.

For the wheel speed sensor to function correctly, it is important that the sensor is clean and not damaged in any way.

BENEFIT FROM FITTING QUALITY PARTS, MAKE WORKING ON THE VEHICLE EASIER, AND FASTER. HERE ARE SOME THE BENEFITS OF USING THE SNR SENSOR RANGE.

THE SNR PRODUCT RANGE

NTN Europe offers you a complete range of wheel speed sensors combining all the technologies available on the market today.

Our range of wheel speed sensors includes almost 350 references that cover nearly 7000 vehicle applications . These references are made up of 65% active sensors and 35% passive sensors, thus covering all the technologies on the market today.

WHY CHOOSE A SNR SENSOR

Thanks to its position as a wheel bearing specialist, **NTN Europe** has been able to develop ASB® technology with the vehicle manufacturers manufacturers.

NTN Europe was the creator of **ASB®** and has also chosen to license the technology to other OEMs, which has allowed it to become a **WORLD STANDARD.**

We have enlarged our range to make it easier for our customers, we have linked our core business - wheel bearings with our know-how, and the the ASB® the sensor!

SNR QUALITY

SNR sensors are tested and checked before being packaged,this allows us to guarantee the reliability of the products.

We carry out:

- Thermal resistance test between -40 and +150°C
- Leak test
- Vibration test
- Mechanical resistance test

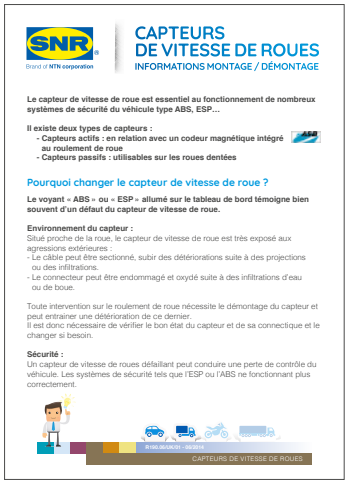
NTN EUROPE IS:

- The inventor of ASB® technology
- Technical know-how in the design and manufacture of ASB® bearings
- 100% control of our production lines
- Extensive testing of all our products
- The first bearing manufacturer to launch its own range of sensors, making a direct link between the sensor and the wheel bearing kit,this makes it easier to find the correct parts needed to carry out the vehicle repair correctly.

NTN EUROPE MAKES AVAILABLE TO ITS CUSTOMERS ALL OF ITS TECHNICAL KNOW HOW:

A catalogue

Dedicated to sensors that links directly to the wheel bearing kits



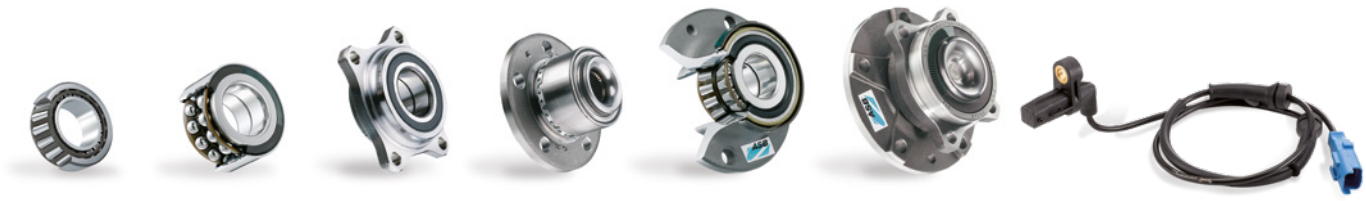
TechInfo

Advice on disassembly and assembley of our products based on the expertise and and know-how of our technicians

TechScaN'R

Technical data via an App Smartphone IOS & Android (free download, 3D photos, direct scan of the part number on the box or in the catalogue).

FOR YOURS AND YOUR CUSTOMERS SAFETY, CHOOSE SNR QUALITY AND KNOW-HOW



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