

Wheel Bearings



ABS and ASB Systems

WBTB 0002

Introduction

Since the advent of the SNR-patented Active Sensor Bearing (or ASB®) system in 1997, there has been confusion over the differences between the meanings of ABS and ASB.

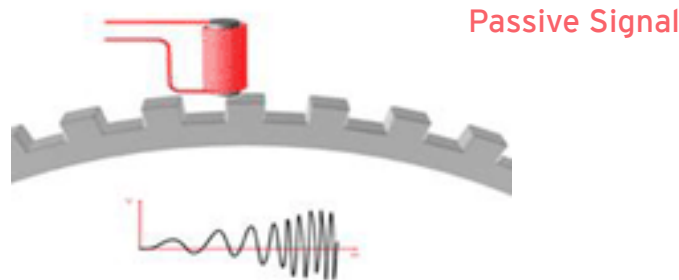
ABS stands for Anti-Lock Braking system and simply indicates that a vehicle has a system fitted which prevents the wheels locking under heavy braking and therefore allows the driver to retain control of the vehicle.

There are two distinct types of ABS system, Passive and Active. The Active systems utilises ASB® technology and replaces the older hall-effect 'phonic ring' type Passive system.

While the traditional 'Passive' systems are now almost totally superseded by the newer Active systems (also known as ASB, or Active Sensor Bearing); when working on a modern ABS-equipped vehicle, it is important to be aware that either system could be fitted. In order to test the system or identify any faults it is imperative to know which system is in place.

Passive System

The older passive systems rely on the movement of toothed 'phonic' wheel which generates an alternating current as it passes by the sensor. The (sine wave) signal frequency and amplitude increases with wheel speed, and generates its own voltage, so no external power source is used. This does mean that when the wheel is not rotating there is no signal produced.



Active System

The active systems use magnetic 'poles' built into an encoder fitted to the rear of the bearing. This encoder is often incorporated into the seal on Gen 1 and Gen 2 bearings. Here, the sensor receives a reference voltage from the ECU (either 5V or 12V depending on the system). The sensor has an integrated circuit which amplifies the signal before feeding it back to the ECU. This system has the advantage that a signal (square wave) is generated regardless of whether the wheel is turning or not. This also means that the signal is far more accurate at lower wheel speeds.



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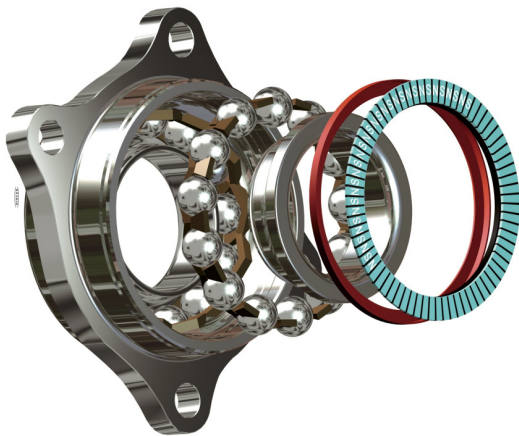
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ASB in Detail

On Gen 1 and Gen 2 bearing-equipped vehicles, a passive system can be identified by the presence of a traditional toothed 'phonic' wheel fitted to the driveshaft or the back of the wheel bearing.

An active system can be identified using an ASB detector card or if one is not available, then a small magnetic object will 'stick' to the magnetic encoder on the rear of the bearing. Note that a small number of hub bearings have the ASB encoder mounted radially rather than axially.

If a vehicle is fitted with Gen 3 bearings, the ABS system will most likely be incorporated into the hub unit. The easiest and most accurate way therefore, to determine which system is fitted, is to perform a back probe test on the sensor with it still connected and the ignition switched on. If an active system is fitted, then the reference voltage (5V/12V) will be seen. -Conducting a resistance test on an active system will show an open reading possibly leading to the incorrect conclusion that the hub or sensor is faulty.



© Pictures: NTN-SNR Group

ASB® is now in use as original equipment on over 80% of new vehicles produced worldwide and 90% of vehicles produced in Europe. To date over 100 million ASB bearings have been produced!

The First Line Wheel Bearing range now includes more than 120 ASB® bearings and this number is constantly increasing.

Obviously ASB is used for Anti-Lock-Braking Systems (ABS), but is also used for Hill Descent Control, Automatic Volume Control, Traction Control, Stability Control and even for Sat-Nav systems when the vehicle cannot obtain a GPS signal.

ASB Bearings are generally fitted in the same way as traditional bearings, but there are additional precautions that should be observed for the storage, handling and fitment of ASB® bearings:

1st generation bearings must be fitted in the correct orientation with the encoded seal facing the sensor. The bearing reference markings are always on the side of the bearing with the encoded seal. If in doubt use an ASB® detector. In the majority of applications the ASB encoder faces inboard (towards the centre of the vehicle) the location of the sensor will confirm this.

ASB® bearings must always be fitted using the correct tools for both removal and replacement to ensure that the encoded seal is not damaged.

Ensure the bearing is correctly stored, away from any source of magnetism (>750 Gauss) and any sources of heat or moisture. If any part of the bearing is damaged it should not be used.

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TECHNICAL INFORMATION