# DIAGNOSTIC EXPERT

ANALYSIS & RECOMMENDATIONS

WHEEL BEARING RANGE

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NTN SNR

With You

## MAIN CAUSES OF FAILURE

Most failures are detected by **noise**; however, there are many causes

1. Indentations or breakage of the shoulder
2. Scratches on successive balls
3. Consecutive flaking due to a faulty seal
4. Fatigue spalling
5. Seizure / Overheating / Faulty lubrication
6. Loss of grease
7. Vibration
8. Difficulty in steering straight
9. Clacking / Noise
10. ABS faults

In most of the cases, when one of these faults occurs,
there is no alternative other than to replace the bearing.

## GENERAL RECOMMENDATIONS RELATED TO FITTING

- Use the correct tools
- Work in a clean and clear area and avoid dropping the part
- An assembly with an abnormal noise requires the bearing to be changed
- Never loosen or tighten the driveshaft nut when vehicle is on the floor
- Do not let the vehicle down on the floor with the driveshaft loose or removed
- The surface of hub and driveshaft must be checked for damage (no cracks or deep scratches)
- To ensure correct operation of the wheel speed sensor, make sure the magnetic seal does not remain in contact with any magnetic part
- Bearings should always be handled with care in order to avoid any damage
- Comply with the manufacturer's torque recommendations

# 1 INDENTATIONS OR BREAKAGE OF THE SHOULDER DUE TO A FAULTY FITTING

## EVIDENCE

- Presence of indentations located on the edge of the track and often seen over the complete circumference of the ring
- The indentations are in line with the position of the rolling elements
- Damaged or broken shoulder
- A slapping noise to the assembly


## CAUSES

- The bearing was off-centre when fitted
- The bearing fitting was incorrect
- The bearing was dropped onto a hard surface
- The bearing tightening load was transferred through the rolling elements

## NTN-SNR ADVICE

- Apply the load on the right ring, the fitting force should not go through the rolling elements
- Follow the general recommendations related to fitting

## 2 SCRATCHES ON SUCCESSIVE BALLS FROM AN UNTIGHTENED DRIVESHAFT

### EVIDENCE

- Damage with circular grooves deforming the surface of the balls
- Grooved scratches similar to “petanque balls”
- Matching damage on the bearing tracks

### CAUSES

- The vehicle was moved without the driveshaft or hub nut in place (such as when being serviced)
- Damage on the balls from contact and rolling on the inner edge of the track, due to a gap between the inner races


### NTN-SNR ADVICE

- Avoid moving any vehicle when the driveshaft nut is not tight

## 3 CONSECUTIVE FLAKING DUE TO A FAULTY SEAL

### EVIDENCE

- Local or generalised oxidation of the bearing
- Reddish or black staining more or less widely distributed on the bearing
- Pitting has damaged the surface to a variable extent

### CAUSES

- Insufficient or incorrect sealing for the installation
- Damage to the bearing seal during maintenance
- Lack/non replacement of the cap

### NTN-SNR ADVICE

- Never dis-assemble a sealed bearing, damage is inevitable
- Avoid spraying with liquids
- Follow the general recommendations related to fitting

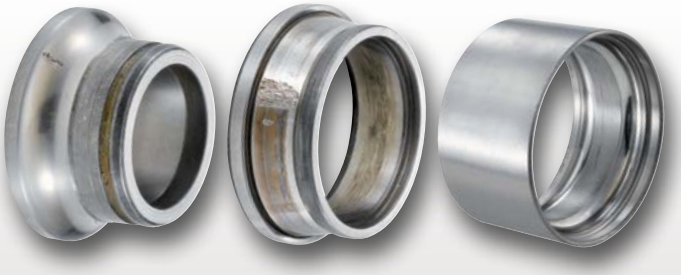
# 4 FATIGUE SPALLING

## EVIDENCE

- Track surface damaged from flaking

## CAUSES

- Faulty fitting
- Faulty (deformed) mating components



## NTN-SNR ADVICE

- Follow the general recommendations related to fitting

# 5 SEIZURE / OVERHEATING / FAULTY LUBRICATION

## EVIDENCE

- The bearing has shallow metal surface damage on the tracks
- The bearing components are welded
- Components are coloured

## CAUSES

- Lack of or incorrect bearing lubrication
- Micro-welding between bearing components
- Grease is contaminated due to pollution ingress

## NTN-SNR ADVICE

- Watch out for any possible loss of grease which appears unusual
- Follow the general recommendations related to fitting

# 6 LOSS OF GREASE

## EVIDENCE

- The mechanic notes an escape of grease from the bearing seals

## CAUSES

- A large rise in bearing temperature causing deterioration of the grease
- Entry of water contaminates the grease

## NTN-SNR ADVICE

- Check that there is not an overheating problem (e.g. a sticking hand brake)
- Check the bearing seal condition

# 7 VIBRATION

## EVIDENCE

- On the road, the driver senses vibrations in the driving compartment

## CAUSES

- Bad condition of the mating parts (a balance problem)
- Incorrect tightening of the bearing

## NTN-SNR ADVICE

- Check the wheel balance
- Follow the general recommendations related to fitting of the wheel bearing or torque

# 8 DIFFICULTY IN STEERING STRAIGHT

## EVIDENCE

- Driven in a straight line the vehicle tends to drift to the left or to the right

## CAUSES

- Incorrect adjustment of the drivetrain
- Steering system stiffness: worn ball joints
- Incorrect tightening of the bearing

## NTN-SNR ADVICE

- Check the axle adjustments
- Replace the ball joints

# 9 CLACKING / NOISE

## EVIDENCE

- A loud noise from the front axle (when parking)

## CAUSES

- A small movement of the bearing in the stub axle housing


## NTN-SNR ADVICE

- Check the dimensions and condition of the stub axle housing

# 10 ABS FAULTS

## EVIDENCE

- The ABS warning panel light comes on or remains on

## CAUSES

- Computer failure
- Sensor failure
- Connection problem
- Encoder deteriorated
- Bearing fitted the wrong way round


## NTN-SNR ADVICE

- Check the encoder and sensor are clean
- Never bring a magnet near to the encoder
- To fit bearings of first generation in the right way, make sure to use the ASB® test card
- Use of the NTN-SNR card tester is essential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