



- 1 Flange indentations or fractures
- 2 Scratches on the balls
- 3 Spalling
- 4 Fatigue spalling
- **5** Seizing / overheating / lubrication failures
- 6 Grease leakage
- 7 Vibrations
- 8 Loss of steering precision
- 9 "Clack" noise
- 10 ABS malfunctions

GENERAL RECOMMENDATIONS

Use original quality parts

- Work at clean and orderly stations to prevent parts from falling
- Use good tools (hammers prohibited, freezer and hot plate unsuitable)
- In case of abnormal noise or force of any kind during installation, bearing must be replaced
- Use suitable tooling and apply assembly force at the correct position on the part being installed
- Be sure to check the condition of the mating surfaces of the hub or stub axle and of the kingpin (no cracks, wear or deep scratches)

- Do not lower the vehicle to the ground with the bearing loose (loose stub axle or driveshaft loosened or removed)
- Do not tighten the driveshaft nut or stub axles with the vehicle on the ground
- To ensure correct operation of the magnetic encoder, do not mark the magnetic surface of the bearing and do not bring it near a magnetic source (magnet or screwdriver); do not remove the ABR plastic cover till ready for installation
- Handle the products carefully
- Apply the tightening torques specified by the vehicle manufacturer. Refer to our TechScaN'R app



FIND OUR WHEEL BEARING REMOVAL AND INSTALLATION TUTORIALS ON **> YouTube** :



Removal and installation of a GEN3 wheel bearing GEN3



Wheel bearing and sensor: Detection of ABS malfunctions



Removal and installation of a rear brake disc with integrated bearing

Removal and installation of a cartridge wheel bearing



Removal and installation of a wheel bearing: Gen 2.1



Removal and installation of a cartridge wheel bearing: on a vehicle



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TechScaN'R



1 FLANGE INDENTATIONS OR FRACTURES

CAUSES

- Use of harsh force during bearing installation
- Skewed installation of the bearing
- Dropping the bearing on a hard floor
- Transmission of installation force via the rolling elements

EFFECTS

- Existence of localized indentations along the edge of the raceway
- Damaged or broken flange
- Clacking sound during installation
- Play in the wheel



RECOMMENDATIONS

- Apply force to the correct ring: the press-fitting force must not be transmitted through the rolling elements
- · Follow the general recommendations associated with the installation



2 SCRATCHES ON THE BALLS

CAUSES

- Use of harsh force during bearing installation
- Skewed installation of the bearing
- Dropping the bearing on a hard floor
- Transmission of installation force via the rolling elements

EFFECTS

- Damage to balls that come in contact with the inner edge of the raceway due to a gap between the inner rings
- Circular deterioration of balls with discharge of material
- Scratches, "croquet ball" appearance
- · Reproduction of indentations on the raceway

RECOMMENDATIONS

 While performing any work on the wheel axles, do not move the vehicle without the nut or bolt that retains the bearing





3 SPALLING

CAUSES

Water Ingress:

- Inappropriate use of the vehicle.
- Missing baffle sealing element
- Deterioration of bearing seal during maintenance
- Missing cap or failure to replace cap

EFFECTS

- Localized or generalized oxidation of the bearing
- · More-or-less extensive reddish or black stains
- · Surface attacked by more-or-less deep pitting
- · Reproduction of indentations on the raceway



RECOMMENDATIONS

- Do not disassemble a sealed bearing
- Avoid splashing liquids

- Follow the general recommendations associated wit the installation
- Replace all parts supplied in the NTN-SNR kits



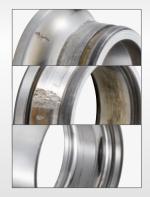
4 FATIGUE SPALLING

CAUSES

- Fatigue
- Incorrect installation
- Incorrect geometry of a neighboring part

EFFECTS

• Removal of material by flaking along the raceway



RECOMMENDATIONS

- · Follow the general recommendations associated with the installation
- Be sure to check the condition of the mating surfaces of the hub or stub axle and of the kingpin (no cracks or wear)

5 SEIZING / OVERHEATING / LUBRICATION FAILURES

CAUSES

- · Lack of lubrication or inappropriate lubrication
- · Micro-welds between the bearing components
- · "Mixed" grease following ingress of contaminants

EFFECTS

- Shallow metal pullouts on the bearing raceway
- Welding of the bearing components
- Discoloration of components



RECOMMENDATIONS

- Monitor for abnormal grease leakage
- · Follow the general recommendations associated with the installation
- · Make sure bearing elements have correct lubrication



6 GREASE LEAKAGE

CAUSES

- Extremely high bearing temperature, causing grease to deteriorate
- Damage of sealing systems during installation (seals)

EFFECTS

Water ingress in the bearing

• Evidence of grease leaking from the bearing seals



RECOMMENDATIONS

- · Verify that there is no overheating problem
- Check bearing seal integrity

7 VIBRATIONS

CAUSES

- Poor condition of neighboring parts (spalling problem)
- Loose bearing

EFFECTS

- Vibrations felt in the steering wheel or in the passenger compartment, while driving
- Risk of bearing damage (spalling, scratches on the balls)



RECOMMENDATIONS

- Check wheel balancing and good condition of tyres
- · Follow the general recommendations associated with the installation



8 LOSS OF STEERING PRECISION

CAUSES

- Incorrect geometry adjustment of the car's front axle
- Rigidity problem of the car's front axle suspension or worn suspension bush
- Loose bearing

EFFECTS

- On straight line, the vehicle tends to go to the right or to the left
- Risk of bearing damage (spalling, scratches on the balls)



RECOMMENDATIONS

- Check running gear geometry
- Replace the worn ball joints or suspension bush
- · Follow the general recommendations associated with the installation

9 "CLACK" NOISE

CAUSES

· Slight displacement of the bearing on the stub axle

EFFECTS

- Clack noise in the front suspension (during parking maneuvers)
- Bearing deterioration



RECOMMENDATIONS

When installing the bearing:

• Verify good dimensional condition and conformance of kingpin seat



10 ABS MALFUNCTIONS

CAUSES

- Computer error
- Sensor error
- Connector problem
- Encoder damage
- Bearing installed backwards

EFFECTS

• ABS® indicator on the instrument panel lights up or remains lit



RECOMMENDATIONS

- · Verify cleanliness of sensor and encoder
- Never bring the sensor or the encoder near a magnetic source
- Check the condition of the encoder seal using the NTN-SNR tester card When installing the bearing:
- Take care not to damage the sensor (tearing off), replace it if that happens
- · Position the bearing with the encoder facing the sensor (inboard side of the vehicle)



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