

Failure Prevention Guide

Wheel Bearings

Smearing

Causes:

a) Between internal parts of the bearing:
Insufficient preload (looseness)
External particles' pollution (water)
Inadequate lubrication (loss of lubricating film)

b) Between bearing and vehicle elements (shaft):
Incorrect bearing selection
Adjustment with clearance (between bearing and shaft)

Prevention:

a) Between internal parts of the bearing:
Check adjustment torque indicated by car manufacturer (preload)
Do not remove bearing seals
Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)

b) Between bearing and vehicle elements (shaft):
Select correct bearing reference
Check adjustment between bearing and shaft (rectify shaft measurements)



Flaking

Causes:

Excessive load
Misalignment (installation failure)
External particles' pollution (water or oxide)
Incorrect fit between shaft and housing
Unsuitable bearing clearance (very tight adjustment)
Inadequate lubrication
Peeling prolongation

Prevention:

Respect load limits provided by car manufacturer
Check adjustment torque indicated by car manufacturer (preload)
Optimize installation procedure
Examine fit between shaft and housing
Do not remove bearing seals
Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)



Scoring

Causes:

Excessive load
Excessive vibrations
Excessive lubrication (grease interference)

Prevention:

Respect load limits provided by car manufacturer
Check adjustment torque indicated by car manufacturer (preload)
Optimize installation procedure
Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)



Peeling

Causes:

Inadequate lubrication
External particles' pollution

Prevention:

Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)
Do not remove bearing seals



Cracks

Causes:

Excessive load
Shock load
Impacts before or during installation
Misalignment (installation failure)
Flaking prolongation
Generation of sudden heat caused by sliding

Prevention:

Respect load limits provided by car manufacturer
Check adjustment torque indicated by car manufacturer (preload)
Correct interference
Inspect shaft profile
Optimize installation procedure



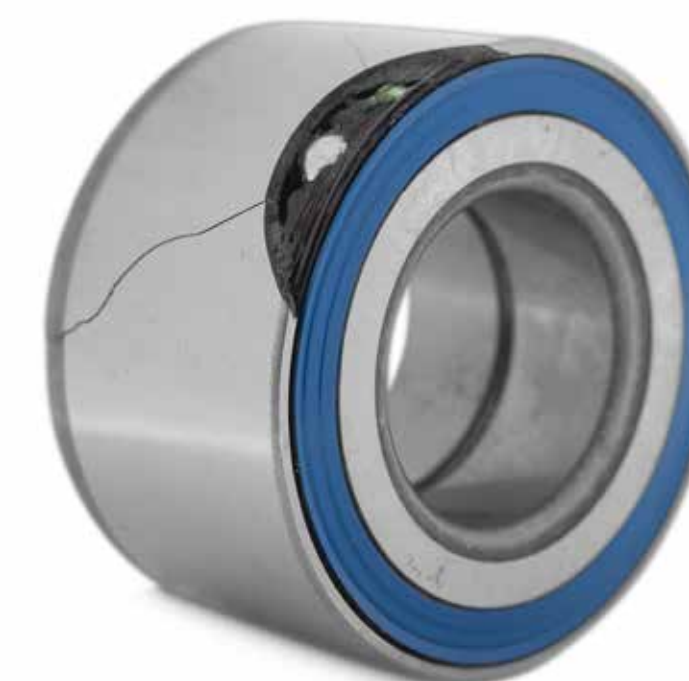
Fractures

Causes:

Assembly failures
Cracks' prolongation

Prevention:

Caution when handling bearing (do not hit, do not drop etc)



Cage Damage

Causes:

Misalignment (installation failure)
Excessive vibrations
Impacts before or during installation
Inadequate lubrication

Prevention:

Check adjustment torque indicated by car manufacturer (preload)
Optimize installation procedure
Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)



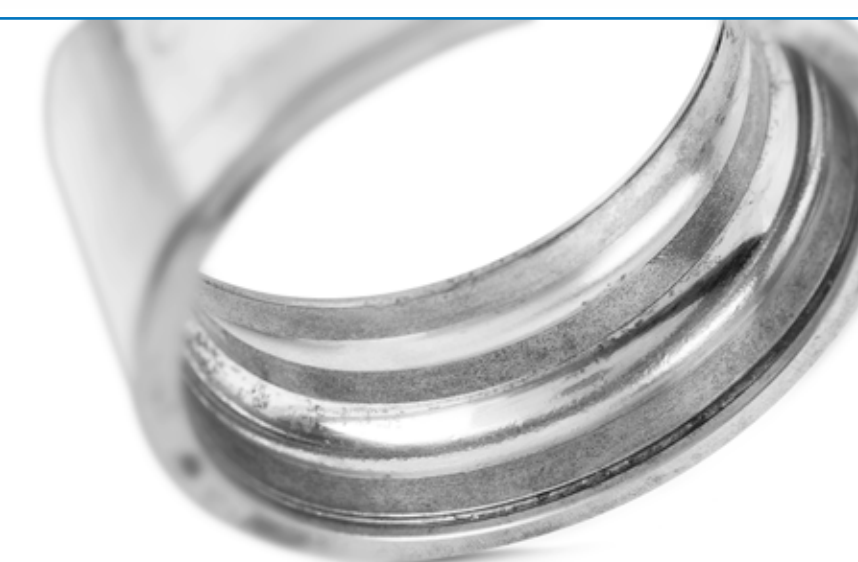
Denting

Causes:

External particles' pollution (metals and oxides)
Impacts before or during installation

Prevention:

Do not remove bearing seals
Optimize installation procedure (clean workplace)



Pitting

Causes:

External particles' pollution
Outdoors lubricant exposure

Prevention:

Clean shaft and housing
Do not remove bearing seals
Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)



Rust and Corrosion

Causes:

External particles' pollution (water)
Filtered moisture
Outdoors storage
Inadequate handling
Removal of anticorrosive oil

Prevention:

Do not remove bearing seals
Improve storage (no outdoors storage)
Wear gloves when handling bearing



Fretting

Causes:

External particles' pollution
Improper adjustment between parts

Prevention:

Cleaning parts that are in direct contact with bearing
Check adjustment torque indicated by the car manufacturer (preload)
Apply anticorrosive oil during installation



Wear

Causes:

External particles' pollution
Progression of oxidation and corrosion
Misalignment
Insufficient lubrication

Prevention:

Do not remove bearing seals
Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)
Optimize installation procedure (clean workplace)
Prevent sliding



False Brinelling

Causes:

Vibrations due to bad adjustment
Insufficient lubrication

Prevention:

Check adjustment torque indicated by car manufacturer (preload)
Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)



Seizure and Discoloration

Causes:

Excessive load
Incorrect fit between shaft and housing
Insufficient lubrication
Unsuitable bearing clearance (very tight adjustment)

Prevention:

Respect load limits provided by car manufacturer
Check adjustment torque indicated by car manufacturer (preload)
Examine fit between shaft and housing
Optimize lubrication technique (only for bearings not greased at the factory)
Do not change, do not remove and do not add any other grease different from that of factory (only for bearings pre-greased at the factory)

