



CORE INSIGHT

In **90%** of bearing failures, the cause is external factors we can control. Improper installation is one of the biggest culprits. By looking after your bearings, you can eliminate **70%** of unplanned plant and equipment breakdowns.

90%

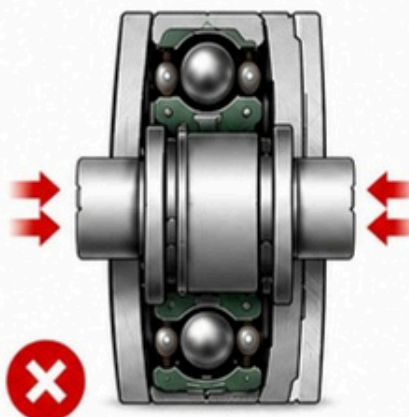
OF FAILURES
CAUSED BY
EXTERNAL FACTORS

70%

OF BREAKDOWNS
CAN BE PREVENTED BY
CORRECT INSTALLATION

1 SHAFT & HOUSING TOLERANCES

Wrong shaft and housing tolerances deform the bearing rings, reducing internal clearance.



- ✗ Oversized shaft or undersized housing
- ✗ Internal clearance reduced
- ✗ Lubrication film cannot develop
- ✗ Metal-to-metal contact
- ✗ Bearing fails shortly after start-up

BEST PRACTICE



Measure shafts and housings with a micrometer.
A vernier is not good enough.



Measure bearing clearance with a feeler gauge.



KEY TAKEAWAY

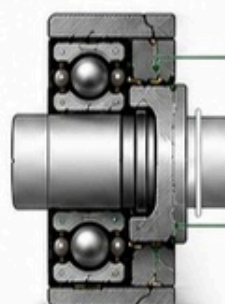
Correct shaft and housing tolerances ensure:

- ✓ Proper lubrication film
- ✓ Correct internal clearance
- ✓ One raceway can creep
- ✓ Maximum bearing life

2 CORRECT BEARING FITS

One ring must be tight, while the other must be free to creep.

RULE 1: INNER RING ROTATES



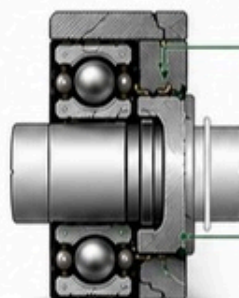
INNER RING
= Tight on shaft

OUTER RING
= Loose in housing



Example:
Electric motors

RULE 2: OUTER RING ROTATES



OUTER RING
= Tight in housing

INNER RING
= Loose on shaft



Example:
Vehicle wheel bearings



3 AVOID THRUST LOAD DEVELOPMENT

Unwanted thrust loads are caused by:



Misalignment



No end-float provision



Combination of misalignment and end-float problems

✓ CORRECT SETUP

FIXED BEARING



FLOATING BEARING



One bearing must be fixed and the other free to float to allow for shaft movement caused by expansion and shrinkage due to temperature changes.

4 PLUMMER BLOCK INSTALLATION

Plummer blocks should be ordered with seals and locating rings.



CASE 1: WRONG (Both against inside)



- ✗ Shaft shrinkage pulls bearings together
- ✗ Thrust develops
- ✗ Pulley can float side to side

CASE 2: WRONG (Both against outside)



- ✗ Shaft growth cannot be accommodated
- ✗ Thrust develops
- ✗ Pulley can float side to side

CASE 3: CORRECT (One located, one floating)



- ✓ One bearing located with locating ring
- ✓ Other free to move
- ✓ No thrust develops
- ✓ Pulley stays aligned

5 USE THE CORRECT TOOLS

Use the right tools to remove and install bearings. This prevents damage and ensures full bearing life.



Bearing puller



Electric bearing heater



Bearing press



Heat-resistant gloves

AVOID



Hammering damages bearings and reduces service life.

KEY LEARNING POINTS

- ✓ Check shaft and housing tolerances before fitting bearings.
- ✓ One ring must be tight, the other free to creep.
- ✓ Always allow one bearing to float.
- ✓ Prevent misalignment and thrust load development.
- ✓ Use the correct tools during installation.