DR.PUMP
& ENGINEERING
CO., LTD

When the pump fails!

BEARING FAILURE SYMPTOMS

4c70 Fractures

Axial surface cracks or fissures on inner rings

Characteristics:
Ring cracked either completely or in part in axial direction. Fracture edges slightly rounded: Sign that the breakage occurred during operation and was rolled over. In case the cracks have sharp edges, the break occurred during disassembly. The edges of a crack can also be broken in part during extended period of operation.

Causes:
– Slippage of bearing
– Chips in the race
– Rotation of inner ring on shaft
– Insufficient lubrication
– Too snug fit on the shaft
– Shaft keyway
– Out of roundness
– Rubbing of adjacent parts

Remedy:
– Better lubrication (additives, increase amount of oil)
– Find remedy for race damage
– Select suitable fit
– Prevent adjacent parts from rubbing
– Create better seat conditions
– Special heat treatment of rings

Outer ring breakage in peripheral direction

Characteristics:
In most cases the crack runs primarily uniformly in peripheral direction. There are usually multiple fragments.
These breaks normally occur somewhat outside of the middle of the race in case of axial loading. Fatigue damage is often the catalyst. The outer ring shell usually shows an uneven contact pattern.

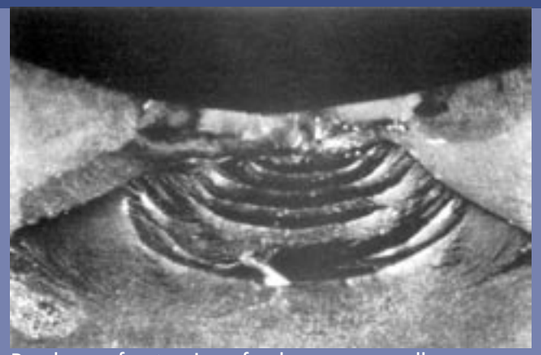
Cause:
Poor support of the ring in the housing.

Remedy:
Improve installation concept.

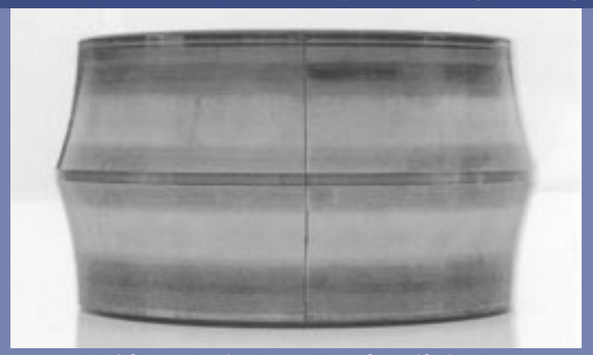
Fatigue failure resulting from race fatigue

Characteristics:
Mostly large-area fatigue damage in the race:
usually stages (lines of rest) in the fractured surface

Causes:
Very advance fatigue damage



Breakage of outer ring of a deep groove roller bearing in axial direction as a result of fatigue



Axial fissure in the inner ring of a self-aligning roller bearing

Outer ring cracked in peripheral direction