PT 500.12
Roller bearing faults kit

Learning objectives/experiments

- vibrational spectrum of the running noise of roller bearings
- familiarisation with the envelope analysis
- influence of damage to outer race, inner race or roller body, on the spectrum
- estimating service lives of roller bearings
- influence of the lubricant on the vibration spectrum
- detection of faulty roller bearings
- understanding and interpreting frequency spectra
- use of a computerised vibration analyser

Description

- **assessment of bearing condition by vibration analysis**
- **comparison of bearings with different faults**

Vibration analysis is a key tool in estimating the condition of a roller bearing. The slow change in the vibration spectrum provides indications of the remaining life of a bearing and can be used as a criterion for its replacement. The spectral distribution can deliver accurate information on the type and location of the damage.

This accessory setup contains six roller bearings on which different faults can be detected and explained. The radial load on the bearing can be set within broad limits using the belt drive accessory set PT 500.14 (setting of belt tension; fixed load).

The accessory setup is mounted on the base plate of the machinery diagnostic base system PT 500.

To measure and evaluate the experiment, the computerised vibration analyser PT 500.04 is required. It includes all the necessary sensors, a measuring amplifier and analysis software to record the vibration phenomena.

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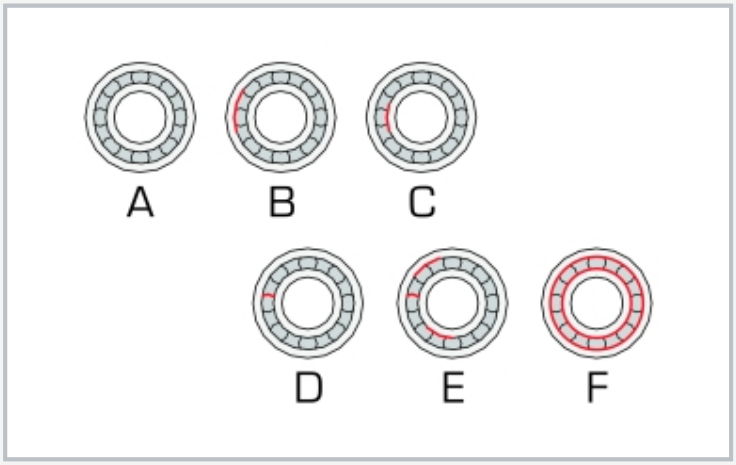
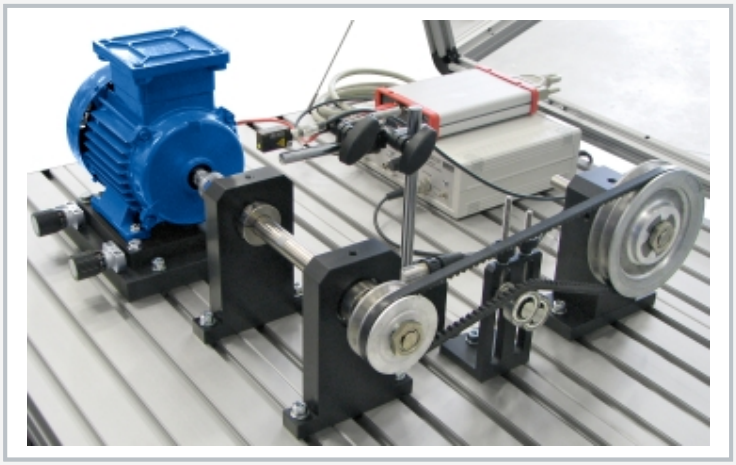
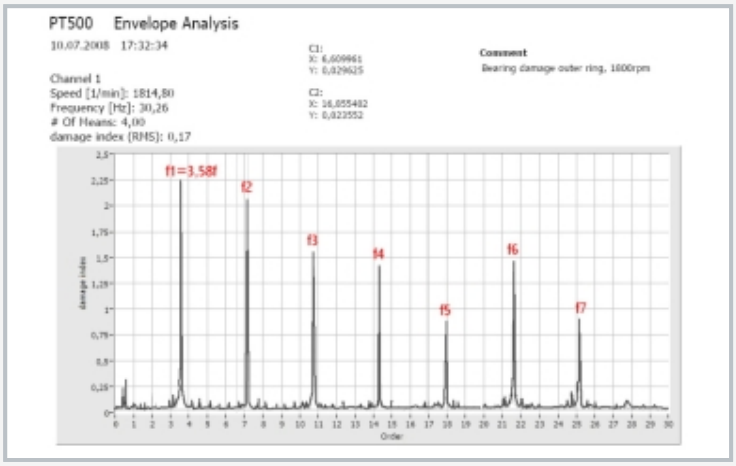


A) undamaged bearing, B) bearing with damage to outer race, C) bearing with damage to inner race, D) bearing with damage to a roller body, E) bearing with damage to roller body, outer and inner race, F) heavily worn bearing



The illustration shows PT 500.12 together with PT 500, PT 500.14 and PT 500.04.



Envelope analysis of the bearing with damage on outer ring (B) at f=1800min^{-1}, damage frequency f_1=3,58f, harmonic waves f_2 to f_7

Specification

[1] investigation of the vibrations of roller bearings
[2] roller bearing with damage to outer race
[3] roller bearing with damage to inner race
[4] roller bearing with damage to a roller body
[5] roller bearing with combined damage
[6] long-running roller bearing
[7] new and undamaged roller bearing
[8] radial loading of bearings with PT 500.14 (belt drive)
[9] accessory set for PT 500 machinery diagnostic training system
[10] stackable storage system to house the components

Technical data

Pendulum ball bearing of type NU204-E-TVP2
- inside diameter: Ø 20mm
- outside diameter: Ø 47mm
- width: 14mm
- number of rollers: 12

LxWxH: 400x300x120mm (storage system)
Weight: approx. 4kg

Scope of delivery

6 roller bearings
1 bearing block
2 circlips
1 circlip pliers
1 storage system with foam inlay
1 manual

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Required accessories

PT 500	Machinery diagnostic system, base unit
PT 500.04	Computerised vibration analyser
PT 500.14	Belt drive kit

Optional accessories

PT 500.01	Laboratory trolley