

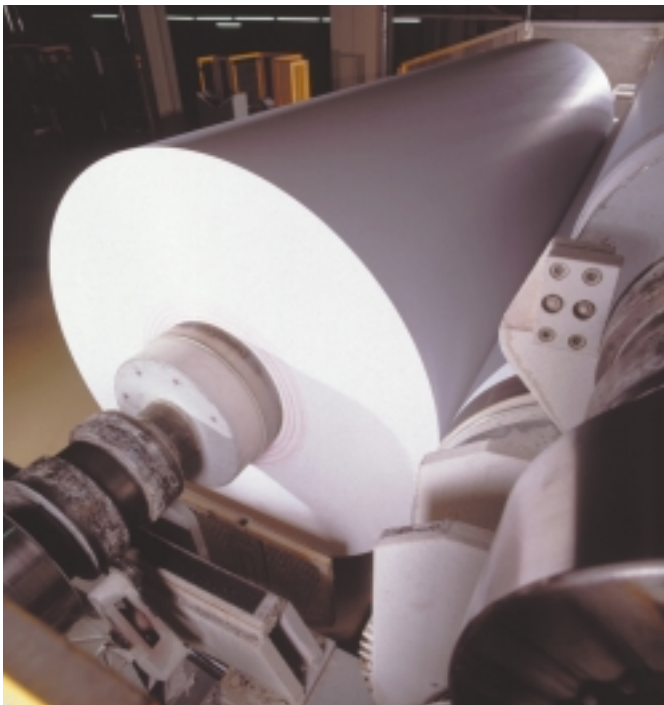
Technical Information



TI No. WL 80-60 E

April 2001

Rolling Bearing Diagnosis with FAG Devices and Services



State-of-the-art, condition-based monitoring of plants and machines

Early detection of bearing damage and monitoring of the damage development permit condition-based maintenance of machines and plants. Knowledge about the condition of a rolling bearing permits users to plan extent and time of repairs and to limit the resulting cost.

With state-of-the-art FAG devices users can carry out rolling bearing diagnoses themselves.

FAG offers two mobile monitoring devices: the Detector 2000 and the Bearing Analyser.

Stationary monitoring devices include a digital vibration monitor and the online monitoring system VibroCheck.

In addition, FAG offers an efficient damage diagnosis service, performed by experienced FAG specialists with the Bearing Analyser.

FAG Detector

The Detector 2000 is a hand-held measuring instrument that was developed together with the PC software FAG 2000 for measuring data in the offline monitoring of production plants. It is user friendly and very easy to operate. Its light weight makes the Detector 2000 the ideal instrument for monitoring large plants where long distances have to be covered on a measuring round.

The Detector 2000 monitors:

- the absolute machine vibrations in accordance with ISO 10816
- the condition of rolling bearings by means of the envelope detection method.

The device features an outlet jack into which any commercially available walkman headset can be plugged. This enables users to listen to the running noise of any machine and form an opinion regarding the condition of a bearing. The Detector 2000 provides the characteristic values of the running noise so that it can be evaluated objectively.

For more detailed information see also TI No. WL 80-62.



FAG Bearing Analyser

The FAG Bearing Analyser is an efficient and reasonably priced vibration diagnosis tool for early detection of rolling bearing damage and gear damage.

All types of damage that cause noise - i.e. vibration - are diagnosed by means of the envelope detection method.

The time signal is broken up into its frequency components by means of Fast Fourier Transformation (FFT).

Even damage in a complex machine can be unequivocally allocated to a machine element (gear, rolling bearing) in this way.

The user is assisted by an "automatic diagnosis" mode. If the bearing geometry and the speeds are known, the software

searches the frequency spectrum for bearing-specific damage frequencies.

If a threshold value is exceeded, the expert system alerts the user of the damage by triggering an alarm.

In this way damage can be detected and analysed regardless of the absolute magnitude of the signal power, even without a reference measurement.

For more detailed information see also TI No. WL 80-63.



Stationary Monitoring Devices

FAG DTECTX1

The DTECTX1 is an effective and favourably priced online monitoring device. All commonly used acceleration, speed and displacement sensors can be connected to it. Depending on the version used, process quantities such as speed, temperature, torque and pressure can be recorded.

The signal measured by the sensor is broken up into its frequency components by Fast Fourier Transformation (FFT). This permits monitoring of amplitudes for previously specified threshold values within very narrow, defined frequency bands and triggering of an alarm if these values are exceeded. In this way damage can be detected at an early stage by means of frequency-selective monitoring.

DTECTX1 vibration monitors with a remote monitoring function permit reliable detection of damage and faults in

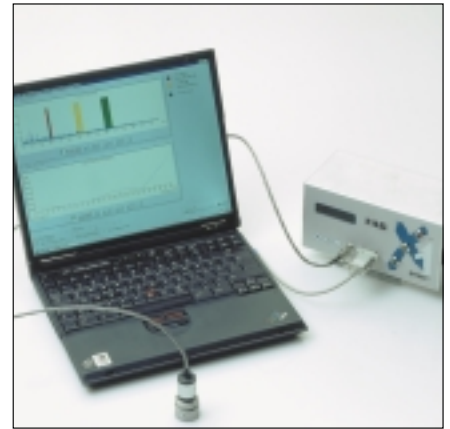
machines without requiring the presence of a diagnosis expert.

DTECTX1 devices automatically report changes – via telecommunication lines (fixed line modem, mobile phone modem or satellite modem) – to the operator, the plant builder or the service provider, no matter of in which place on Earth they are used.

With this version, the modem permits remote access to the DTECTX1 at any time. Measured data can at any time be called up from a distance and analysed by the diagnosis centre.

Another DTECTX1 version can automatically issue an alarm if a threshold value is exceeded.

Thus the DTECTX1 permits a cost-effective, condition-based maintenance.



For more detailed information see also TI No. WL 80-65.

FAG VibroCheck

The online monitoring system VibroCheck is used for permanent monitoring of vital machine elements such as rolling bearings and gears. Not only vibration signals can be measured but other physical quantities like temperature, power, pressure etc. as well. The measured signals can also be used for a remote diagnosis.

In addition to the general monitoring of characteristic values, users are assisted by an automatic expert system which indicates damage at an early stage. The system takes advantage of the fact that frequency analysis reveals even the smallest amplitudes of periodic signals so that these signals can be evaluated before they can influence composite characteristic values. The expert system obtains its in-

formation from an automatically conducted frequency analysis. A bearing list contains all bearings and bearing elements that are to be monitored by VibroCheck.

Especially due to its very high reliability in predicting damage, VibroCheck is suitable both for use in machinery with rapidly wearing elements and in plants requiring relatively little maintenance.

VibroCheck minimizes the risk of an unforeseen failure of a machine element and contributes to a speedy repair of damage.

For more detailed information see also TI No. WL 80-66.



FAG Service

FAG Service

The FAG preventive maintenance service helps you reduce maintenance, downtime and production loss cost caused by unforeseen rolling bearing damage.

FAG specialists perform rolling bearing diagnoses at specified bearing locations. Evaluation of the measurements is effected on the spot.

Rolling bearings are checked for damage by means of the field-proven enve-

lope detection method in combination with an evaluation software with an automatic-diagnosis function.

Even a single measurement yields a very accurate result. An increased accuracy is possible if the measurement is repeated periodically.

On request, a detailed condition report and a detailed examination report plus a list of recommended measures will be prepared.



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