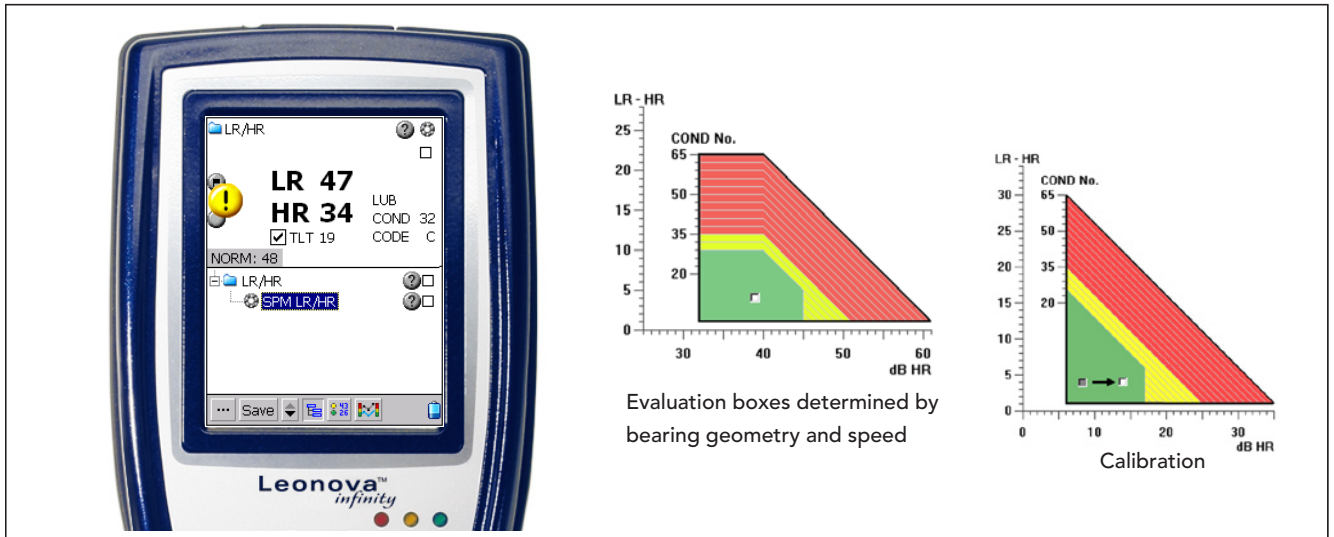


Leonova™ Infinity – Shock pulse measurement, LR/HR



The LR/HR method was developed from the original Shock Pulse Method for condition diagnosis of rolling element bearings. It allows a precision analysis of oil film condition in the rolling interface and contains calculation models for finding the optimal lubricant. Poor lubrication is the root cause of most bearing failures.

Signal and measurement

Transducer and measuring procedure are the same as for the dBm/dBc method (TD-213). The shock pulse meter counts the rate of occurrence (incoming shock pulses per second) and varies the gain until two amplitude levels are determined:

- HR = high rate of occurrence, quantifying the shock carpet (approx. 1000 incoming shocks per second).
- LR = low rate of occurrence, quantifying the strong shock pulses (approx. 40 incoming shocks per second).

LR and HR are 'raw values', measured in dBsv (decibel shock value).

Input data

The LR/HR method requires more precise data on the bearing, because bearing geometry, as well as size and speed, affect the shock carpet and thus the analysis of oil film condition in undamaged bearings. The rpm is needed, plus a definition of the bearing type and size. This is best input by stating the ISO bearing number, which links to the bearing catalogue in Condmaster.

Evaluation

After measurement Leonova returns

- a general description of bearing condition (CODE)
- a value for oil film condition (LUB)
- a value for surface damage (COND).

A LUB no. of 0 means dry running, the value increases with oil film thickness. A COND no. of around 30 indicates surface stress or early damage, the value increases with damage severity. The general assessment is:

- CODE A Good bearing
- CODE B Poor lubrication
- CODE C Dry bearing, risk of damage
- CODE D Damage.

A program part, LUBMASTER, uses the shock values plus data on lubricant type, viscosity, load and operating temperature to calculate the bearing's life expectancy under present condition. It also calculates the effect of changes in oil type and viscosity.

Calibration

The accuracy of the LR/HR method is increased by a calibration factor (COMP no.) used in case of bearings with minimal load or poor quality measuring points (in both cases the signal strength is below normal). On the basis of the bearing's catalogue data and the lubricant properties, Leonova calculates the normal shock level for a good bearing and compensates for an abnormally low signal before returning the evaluation results.

Technical data

Measuring range: -19 to 99 dBsv

Resolution: 1 dBsv

Accuracy: ± 1 dBsv

Transducer types: SPM 40000/42000, probe transducer and quick connector transducer for adapters

Input data: Rpm, plus bearing type and mean diameter (or ISO bearing number)

Output: LR and HR (raw shock values),
CODE A to D, evaluated green - yellow - red.
LUB no. for oil film condition,
COND no. for surface condition.

Ordering numbers

- LEO131 Shock pulse method LR/HR, unlimited use
- LEO231 Shock pulse method LR/HR, limited use

