SCHAEFFLER

Schaeffler Global Technology Solutions

Power transmission

Reliable Monitoring of Drive Shafts

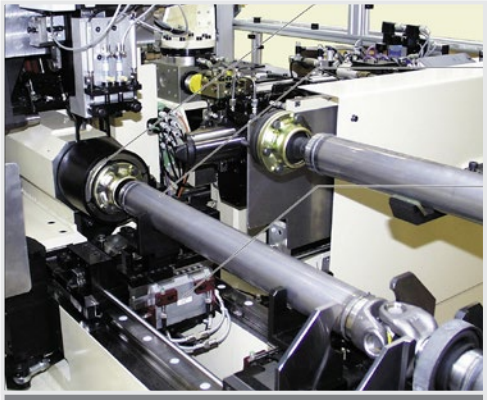
The customer is a leading worldwide manufacturer and spare parts supplier in the power transmission sector, and also develops individual solutions for his own customers, who come from the industrial and automotive sectors. This range of products and services is rounded out by an in-house after sales service department.

Challenge for Schaeffler

The drive shaft (propshaft) is the component that is subjected to the most severe load in industrial drive trains. The force is transferred from the motor in a complicated manner by way of a universal joint, which means that a redirectdi-on of the rotary axis takes place. The onset of damage here is difficult to detect and in most cases means high production downtime costs. The customer was therefore looking for a vibration measuring system that could precisely and reliably record the vibrational behavior of the entire drive shaft and, together with measurement values for speed and other parameters, would allow the status of the universal joint and the plummer block housed bearing units supporting the drive shaft to be reported.

Schaeffler Solution

The FAG SmartCheck fulfills all the necessary criteria for performing this demanding monitoring task successfully. Working together, Schaeffler's vibration experts and the customer used a purpose-built test stand to further develop the FAG SmartCheck in such a way that it can now reliably perform the complex task of monitoring the vibrations that occur in the universal joint's rolling bearings.



Technical Information on the Drive shafts

Types:

- Drive shafts
- Double-jointed drive shafts

Performance characteristics:

- 500 – 10 000 RPM
- 1 000 – 2 500 mm installation length

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Drive shafts can be reliably monitored using the FAG SmartCheck

In the event of an alarm, the after sales service department is immediately alerted by the FAG SmartCheck

Schaeffler worked closely with the customer to develop a solution tailored to his needs

Customer Benefit

The use of a vibration analysis to detect damage in the drive shaft's universal joint at an early stage is a new development and provides the drive shaft manufacturer with a unique selling proposition on the market. In addition to the drive shafts themselves, it allows him to offer his own customers a monitoring system that significantly reduces the risk of unplanned downtimes and thus generates quantifiable added value. The customer can also carry out transparent damage analyses, which is a benefit to his own after sales service and internal development departments.

What's special

Because the drive shaft in the drive train is only in contact with rotating parts, it is not possible for sensors to be mounted directly on it. What is more, the rolling bearings in the universal joint do not rotate, they simply perform an oscillating motion. The amplitude of this oscillating motion can be larger or smaller, depending on the angle of the drive shaft and output shaft in relation to each other. The FAG SmartCheck has been proven to deliver reliable condition information even under these difficult conditions.
The example illustrated here shows how Schaeffler can support machine manufacturers in the development of individual monitoring solutions and efficient service concepts.

Technical Information about the Solution
Monitoring system used:
4 FAG SmartCheck
Monitored components:
• Drive shafts • Double-jointed drive shafts
Vibration sensor used:
High-resolution piezo sensor
Monitored operating parameters:
• Speed • Torque
Diagnostic methods:
• Time signal • Envelope curve • Speed and frequency tracking • Spectrum and trend analysis

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