

CASE STUDY

Industry: Automotive
Customer: Vehicle Garage in Germany

OFF-HIGHWAY 
POWERTRAIN SERVICES

▶ Off-Highway Powertrain Services reduces vibrations through onsite balancing in vehicles

▶ Case Description:

A vehicle garage contacted Off-Highway Powertrain Services (OHP Services) because vibrations were occurring on passenger transport vehicles at certain engine speeds.

OHP Services recommended a vibration measurement to find the reasons for the vibrations which could be felt through the passenger seats and to identify opportunities to improve the vehicles' powertrain. For this purpose the vehicle had been equipped with vibration sensors which recorded data during a test ride (on the street).

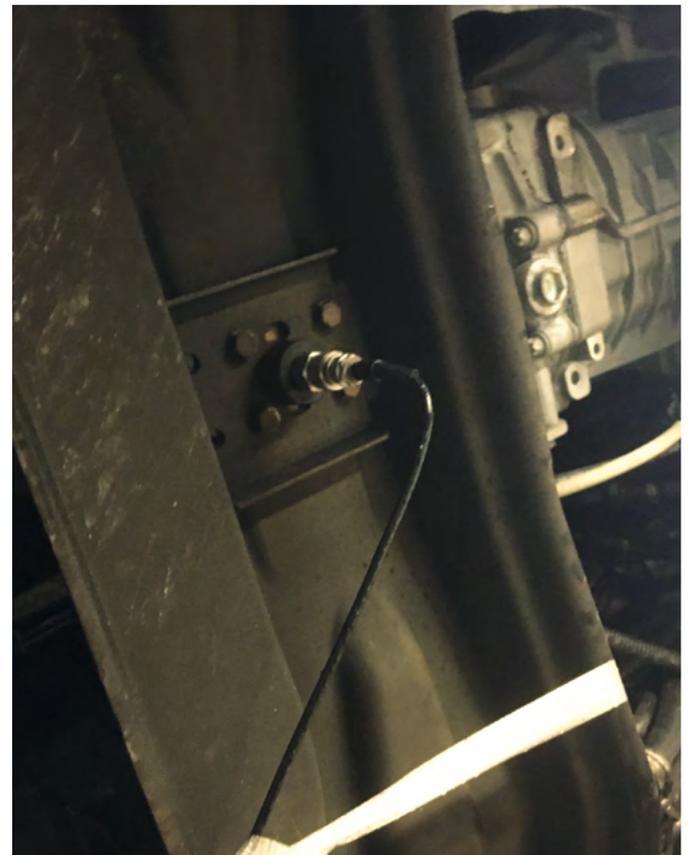
The measurement values demonstrated that the main vibrations are increasing at a speed range around 80km/h. Further investigations confirmed resonance in a center bearing of the cardan shaft which was installed 6 mm too high. Due to the wrong alignment the acceleration forces became stronger creating vibration. To reduce this effect the center bearing was lowered and the powertrain rebalanced.

In addition the vibration data indicated a small imbalance of the retarder disc. To protect the bearings and the complete powertrain lifetime, balancing was performed onsite.

The changes have been verified by a second vibration check and the customer is very satisfied with the results.

▶ Technology Snapshot:

Different technologies like vibration measurement, thermographic measurement and alignment check are used to get to the root cause of the problem. A multi-channel vibration measurement system was used for the vibrations and natural frequency analysis performed. Sensors were installed at different positions of the powertrain to record these



Sensor mounting for mobile vibration measurement

measurements. Detailed, factually evidenced reports were generated to support maintenance decision making.

The main advantage of this service is early detection of fundamental powertrain faults minimising the risk of unplanned shutdowns.

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▶ **Challenge:**

- ▶ Discover reasons for vibrations at a certain engine speed
- ▶ 4 hours timeslot to complete measurements (until bus was booked for the next job)

▶ **Solution:**

- ▶ Measure vibrations to determine the problem
- ▶ Improve the alignment of the center bearing and rebalance the powertrain



Mobile device for vibration measuring

▶ **Customer Value:**

- ▶ Reduced vibration level
- ▶ Increased durability of the powertrain
- ▶ Targeted identification of the defect
- ▶ Reduced repair costs due to fast & targeted problem solving without trial & error
- ▶ Short downtime due to onsite service in the vehicle garage
- ▶ Reduced risk of future unplanned shutdowns

▶ **What´s special?**

- ▶ OHP Services as a service company considers the complete powertrain system by using several analysis methods to understand the function and problems of each single part and to identify the root cause of an individual problem.

With our deep understanding of the powertrain OHP Services is able to prevent possible consequential damages due to misalignments or imbalance.