

# CASE STUDY

**Industry:** Marine  
**Customer:** Energy utility company in Germany

OFF-HIGHWAY  
**POWERTRAIN SERVICES**

## ▶ Huge time-saving through endoscopy in Marine application

### ▶ Case description:

A customer called Off-Highway Powertrain Services (OHP Services) with a request concerning the transmission of a ship. Because of the weight of the engine system it was not feasible to separate the transmission from the engine. Therefore Powertrain Services used endoscopy through the oil filler plug to evaluate the condition of the inside of the transmission. The endoscopy allowed us to view all the bearings around the driveshaft and the output shaft.

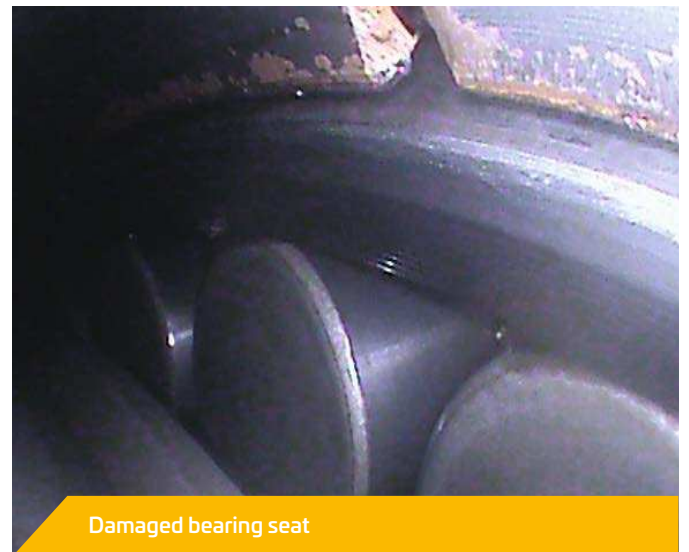
After gathering findings about the possible origin of the root cause, OHP Services was able to dismantle only the affected parts of the transmission to enable further detailed investigations. When opening the bearing cap OHP Services discovered an incorrectly installed and defect shaft seal. OHP Services also detected swarf contamination in the oil. Further investigation revealed the reason for this; it was discovered that the axial roller bearing of the driveshaft had broken. Excessive pressure and insufficient oil transported to the top roll can be reasons for the bearing breakage and the defect sealing.

### ▶ Technology snapshot:

#### Endoscopy

Different technologies such as vibration analysis, thermography and endoscopy were used to determine the root cause of the problem. A small camera with a 3mm lens and a swiveling luminaire head allows clear observation of the powertrain.

Hard to reach areas and parts can be explored easily without the costly and time consuming opening and dismantling of the system. Especially in these cases the endoscopy is a very useful method to get a first indication of the problem and to avoid cost intensive long term stops.



Damaged bearing seat

As this service job was planned and the special sealing and bearings were ordered based on the previous inspection, the repair time and the resulting dockyard costs were reduced to a minimum.



Examination of a gearbox with an endoscope

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▶ **Challenge:**

- ▶ Find the origin of the noise out of the transmission without dismantling the whole powertrain

▶ **Solution:**

- ▶ Endoscopy of the transmission with a camera through the oil filler plug to observe all the bearings around the powertrain to identify the root cause of the problem
- ▶ These observations allow the identification of the problem origins without the costly and time consuming full dismantling of the system

▶ **Customer Value:**

- ▶ Onsite service without costs for the transport of the ship into the next harbor
- ▶ OHP Services extensive experience with powertrain systems which simplifies the problem identification
- ▶ Endoscopy enables OHP Services to have a quick view of the inside of a machine without dismantling it

- ▶ Targeted identification of the root cause and ensuring only the required spare parts are ordered
- ▶ Minimal downtime of the powertrain is necessary to do the inspection

▶ **What's special?**

- ▶ OHP Services as a service company considers the complete powertrain system by using several analytical methods to understand the function and potential problems with each individual component. In this specific case the endoscopy of the transmission provided an important insight as to the cause of the problem.

As a result it was not necessary to dismantle the whole transmission but only the relevant parts of it. Due to the swiveling luminaire head, difficult to reach areas can be easily inspected. This method saved a lot of time and money for the customer and helps to prevent possible consequential damages due to swarf and missing lubrication.

OFF-HIGHWAY  
**POWERTRAIN SERVICES**

**WORLDWIDE**

Off-Highway Powertrain Services collaborates with manufacturers and logistics partners worldwide: benefit from our extensive network. By means of our Service Parts Availability Module, you can define which part are to be available, and how quickly they can be delivered to your location – regardless of manufacturers. We also offer customized spare parts to our clients on stock.

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This case study is exemplary only. Any and all information, data, values, products, procedures etc. which are mentioned in this case study vary from case to case and can be different. For calculation pertaining to your business, please refer to a Off-Highway Powertrain Services employee.