

Pre-amble

It is preferred to measure alignments with coupled shafts. If the shafts are coupled by means of an elastic coupling, a shaft laser system can be used. When the installation is lacking a flexible coupling, the vertical alignment can be verified by using Jack loads (bearing loads). An accurate alignment can only be achieved by disconnecting the shaft pieces and use the Gap/Sag method. When performing alignment measurements for Service purposes, there is normally no time available to decouple the shafts. Furthermore, there is a significant risk that the fitted bolts which are used to couple the shaft segments, get damaged during the (dis)mounting.

Another way of measuring alignment, is to measure the bending in the shafts and to compare the results with a theoretical elastic line model. The amount of bending of the shafts is determined by measuring the stress on the outside of the shafts by means of Strain Gauges.

Technology

ExaktAlign is using is state of the art software for modeling. In this software an accurate 3D model is built from the actual propulsion installation. The software is able to calculate the shaft alignment, whirling vibration, bending vibration, axial and torsional vibration. Aforementioned parameters can be calculated during different operating conditions (empty to ballast and cold to warm).

The strain gauges are carefully glued to the propeller shaft in pre-defined positions (nr of gauges depend on the installation). The gauges are connected to a device that measures the change in resistance when the shaft is turned 180° . This change in resistance can be entered into the model and the actual horizontal and vertical alignment can be determined. Comparison to manufacturer's alignment instruction results in the needed adjustment of component(s).

When the theoretical model is prepared before the scheduled maintenance, the repair period can be as short as possible.



Installation of a strain gauge

Fields of application

Strain gauge modelling/measuring is used in both new building and maintenance / repair. The technique is used in both 2-stroke as 4-stroke installations.