GLM Lasermeßtechnik GmbH – Measurement of locomotives

Frame measurement of locomotives

For more than 25 years GLM Lasermeßtechnik offers mobile 3D measuring systems for frame measurement of locomotives of various types. We appear here as a supplier of complete 3D measuring systems as well as a measuring service provider. Our experience includes the frame measurement of historical steam locomotives, diesel locomotives and electric locomotives.

Reasons and complexity

The frame measurement of locomotives is needed in construction, major overhaul (heavy maintenance) and after derailment. To measure the locomotive frame the following conditions must be given. The bogies must be removed and the vehicle must be jacked up with a lifting jack (4-point support). This is necessary to reach all important measuring points. The measured data is a requirement for the calculation of the vehicle coordinate system and the requested dimensions. The vehicle does not have to be tension-free. GLM refers here to DIN 27202-10, which specifies that a locomotive is a category A vehicle (torsionally rigid body). These must be in a levelled reference position (position in which the vehicle body is in a horizontal plane in 4-point support). The reference position can be established using the 3D measuring system.

The customer or the workshop determines which dimensions including tolerances have to be measured and to what extent. A complete frame measurement is usually completed within half a day. The frame measurement of locomotives includes the following:

- the torsion of the vehicle frame in z
- Distance of the pivots, turrets or hanging baskets to each other
- Perpendicularity of the individual elements (e.g.: pivot, sliding jaws or front plate) to the reference plane
- Misalignment of the buffer plate
- Sag of the longitudinal beam
- Perpendicularity of cross member to longitudinal member
- Perpendicularity of the wear buffer beam to the vehicle center line
- Storage of the buffers (inclined position

Below you will find an extract of locomotives measured so far:

- V90 bzw. BR 29x (BR 290 und BR 294)
- V60 bzw. BR36x
- BR 110
- BR 184.1 und BR 184.2
- BR 151
- Vossloh G765 C
- MAK
- Köf

The basis for the frame measurement of locomotives are different sets of rules (e.g.: Ril900.0070 and DIN 27202-10)