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Road vehicles — Calibration procedure for displacement devices

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National foreword

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Foreword

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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 36, *Safety and impact testing*.

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Introduction

This document was written to address the need of the automotive crash testing community for a well-defined calibration method of displacement sensors.

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Road vehicles — Calibration procedure for displacement devices

1 Scope

This document establishes a procedure to calibrate 1D displacement transducers with nearly linear transfer functions. This procedure is tailored to the needs of sensors used in crash tests. The calibration is carried out with the sensor disassembled from the dummy or test system. The procedure is valid for sensors with analogue as well as digital output.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
displacement calibration
point to point calibration against a traceable reference

4 Displacement calibration procedure

4.1 General

The calibration is running according the classic calibration method for standard displacement devices like dial gauges. The procedure is performed on a linear calibration fixture and measurement system.

During displacement calibration components are used to fix the transducer to a calibration fixture. These components do not necessarily belong to the final assembly of the sensor as used in the dummy.

The calibration data are entered into a data-processing software. The software calculates the maximum interpolation error and the maximum hysteresis per calibration range. In addition, the software calculates the repetition error at a measuring point that is approached from one direction.

4.2 Preparations

Check the sensor and the calibration fixture for any mechanical play, like loose screws, mechanical components, interfaces, etc., and fix as necessary.

4.3 Test equipment set up

— Conduct the calibration in a temperature-controlled environment between 20 °C - 25 °C.

— The transducer, cabling, and any associated circuitry has to be connected to the measurement system in the same fashion as during normal operation.

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