

Focus on IFA's work

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Acceleration measuring devices for truck crash simulators

Problem

During training sessions for truck drivers, the German Social Accident Insurance Institution for the transport industry employs crash simulator devices to practically demonstrate the benefits of wearing a seat belt in a crash. In a crash simulator, a driver's seat is occupied by a test subject secured with a three-point belt, accelerated to about 10 km/h and then abruptly braked.

After the test, it was often impossible to sufficiently describe the effect of the sharp braking and the protective effect of the safety belt with exclusively verbal explanations.

To measure the braking process and the resultant key signals and data of the abrupt braking, measuring devices were to be installed so that all the aspects necessary for comprehension of the benefits of wearing a belt can be presented visually and with maximum instructive effect. The test subject should also be able to take home the data from his crash test on paper.

Activities

Two acceleration measuring devices were developed and installed in the crash simulator device. They contain an acceleration sensor with amplifier electronics, digital measured data acquisition, an LCD display for presenting the test results and a printer to print out a simple record sheet listing all the key signals and data.



Acceleration measuring device with details of measured signals and data

Because of the high mechanical loads from the brake impact, only shock-proof elements could be used. Software was developed to control the equipment and output the signals and data; this software also contains helpful monitoring and calibration functions.

Results and Application

After each test, all the desired calculations and presentations of the physical parameters of the abrupt braking are available for instructive talks with the test subjects. If desired, the test subject can take the results home with him on a printout. As a result of the modifiable software, further calculations and other presentations of parameters are possible, as may arise in the future daily use of the measuring devices.

Measuring devices of this kind are not available on the market in this compact form and with the various installed functions.

However, as “home-grown” units, they can be employed with minor technical modifications in similar applications for acceleration measurements.

Area of Application

German Social Accident Insurance Institution for the transport industry

Expert Assistance

IFA, Division 5: Accident prevention – Product safety

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