

FMVSS 214/216 Side Intrusion /Roof Crush Test System

Purpose

Federal Motor Vehicle Safety Standards (FMVSS) 214/216 specify requirements for vehicle structural strength to reduce the frequency and severity of injury in side impact and roll-over collisions. The equipment described will perform tests according to both the FMVSS 214 and 216 specifications, plus other Research and Developmental Testing.

Description

Test equipment consists of a vehicle mounting test bed plate, A-frame loading stand with moveable crosshead roof-crush platen attached to a linear ball-bearing slide to provide vertical height adjustment along with roof crush travel in a single mechanism. Load cells are placed so as to avoid slide friction measurement and a linear displacement transducer measures the linear motion of the roof-crush platen during crush.

A side intrusion semi-cylinder is nested inside the roof-crush structural support mechanism and is advanced via a DC drive electric motor. Load cells measure the side intrusion force and a linear displacement transducer measures the intrusion motion.

Computer, printer, and control electronics are housed in a vertical rack enclosure especially prepared for electronic instrumentation

Control System

All electronic control and data acquisition systems provided by TMSI are integrated completely for control by a single PC with Windows® based software for intuitive operation with minimal operator training.

TMSI MicroTeStation™ housed in 20.5 W x 72 H x 24 D inch instrument rack enclosure. Includes:

- Intel Pentium® Based Microprocessor Industrial Computer
- Standard Hard Disk Drive
- Single 3.5 in. Floppy Disk Drive
- Removable Disk Drive for Data Archival and Storage
- Random Access Memory
- SVGA Color Monitor
- Windows® 95/NT Operating System
- 16+ Chnl A/D, DIO On-board data acquisition/reduction system
- 6+ Chnl Anti Alias Filters
- Telephone Modem
- Color Printer

Data Acquisition/Control

Parallel full-time data acquisition/control processing is accomplished by MicroStar Data Acquisition Processors (DAP) which feature on-board CPU and memory as well as Analog to Digital and Digital to Analog converters. Closed-loop PID control is achieved on-board the DAP unit for full software

TMSI

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tunability of the DC drive linear actuators in both load and position feedback control.

- MicroStar DAP Data Acquisition Processor to operate in parallel with the Pentium Based Microprocessor
- ComputerBoards CIO/DIO 24 SSR, Solid State Relays for sensing and controlling digital inputs and outputs

Software

RoofTEST™ is *TMSI's* data acquisition/reduction program to operate the on-site MicroTeStation in Windows 95 presentation, control tests according to FMVSS 216, reduce and present tabular and graphical reports, and archive tests results to hard or floppy disk.

SideTEST™ is *TMSI's* Structural Load/Deflection Test Program to operate the MicroTeStation in Windows 95 and acquire, present, print, and archive Load/Deflection Test data according to the requirements of the FMVSS 214 test.

Both programs were created and are owned by *TMSI* and are custom tunable according to Customer requirements.

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