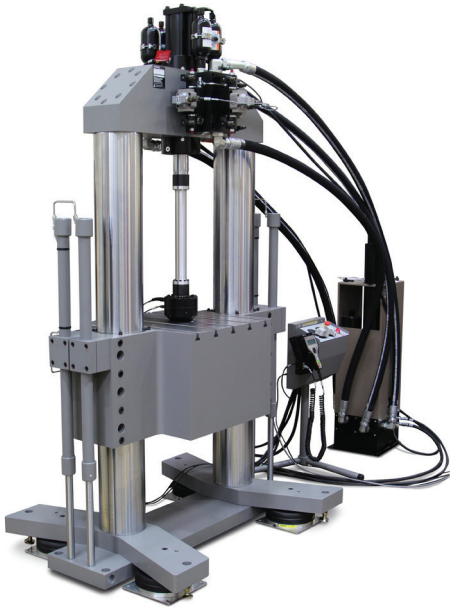


## MTS High-Force Bushings Test System



Uniaxial Loading Test System

Rubber bushings are a key component in a railway bogie assembly for damping axial, radial, torsional and conical loads. Furthermore, they assist in evaluating performance accurately, including dynamic characterization, static deflection, resonant search, tearing energy, and durability. With a history in elastomer testing market, MTS offers a range of systems from uniaxial to multiaxial, with numerous key benefits:

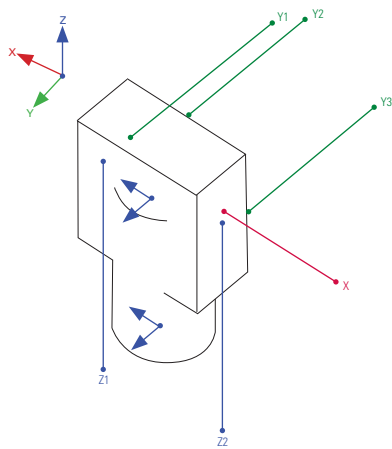
- » Automatic compensation of load frame deflections
- » Automatic correction of dynamic errors in all transducers and conditioning signals
- » Model 505 HPUs with integrated noise isolation, meaning no air ventilation is required and they can be positioned directly beside the test system
- » MTS FlexTest® controller which sets the testing standard in automobile industry.
- » Powerful Multi-Purpose Testware® software for specialized test creation and automation
- » Compensation algorithms
- » Amplitude phase control
- » Amplitude iterative control
- » Other compensators available on controller include:
  - Null pacing
  - Peak valley compensation
  - Peak valley phase
  - Arbitrary end-level control
- » Sophisticated MTS Elastomer Software designed specifically for elastomer testing and analysis
- » RPC software can be added to the controller for enhanced durability testing
- » Installation, introduction, and training by experienced MTS engineers
- » First year warranty included in system price
- » SSP contract (software support plan) included in price for 1st year
- » Elastomer user groups held regionally every 1 to 2 years

### SYSTEM SPECIFICATION

- » Frequency range: 0.01-200 Hz:
  - Less than 5% change in stiffness
  - Less than 0.5° phase shift
- » Static force: +/-100 kN
- » Displacement: +/-50 mm
- » T-slot table for easy mounting of fixture
  - 584 mm x 596 mm
- » Test space
  - Width between column: 609 mm
  - Maximum vertical test space with actuator at mid stroke: 914.4 mm.
  - Minimum vertical test space with actuator at mid stroke: 0 mm.
  - Overall height: 2,286 mm

## ELASTOMER DYNAMIC CHARACTERIZATION SOFTWARE

- » Up to four channels of synchronized simultaneous control
- » Mixed mode control – dynamic control and mean level control programmed independently
- » On-line compensation tools include:
  - Amplitude phase control (APC)
  - Outer loop iterative control (OLIC)
- » User programmable digital I/O
- » Some of the features of the analysis package include:
  - Dynamic stiffness vs. frequency graphs
  - Phase vs. frequency graphs
  - Report generation tools

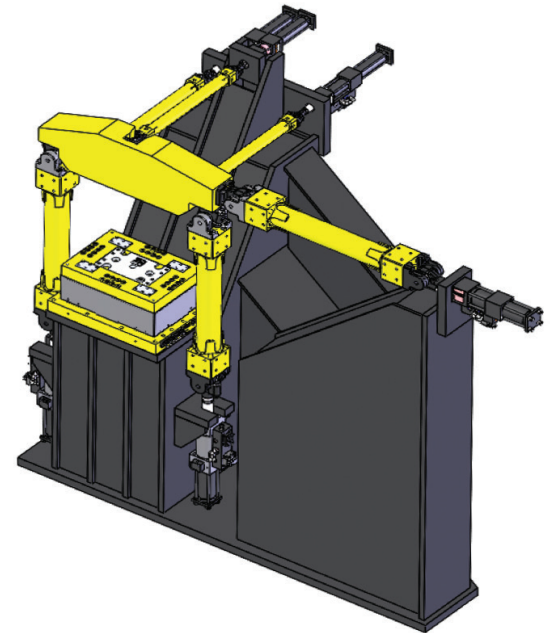
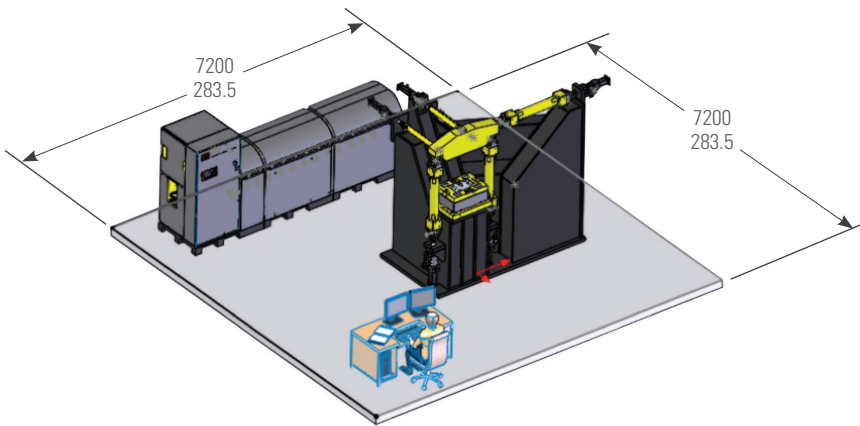


## OPTIONAL ELASTOMER SOFTWARE PACKAGES

- » **Advanced dynamic characterization software:** Provides additional pulse or sine-on-sine excitation, used to simulate input onto tire.
- » **Static deflection software:** Used to measure and calculate the static stiffness of an elastomer material or component.
- » **Trend Monitoring:** Used in fatigue testing to determine functional failure of a component.
- » **Elastomer quality control software:** Used to simplify pass or fail decisions and to integrate a system into a production line.
- » **Resonant search and dwell software:** Used to find the resonant point in a material or component and determine its fatigue life at that point.
- » **RPC time history play-out and acquisition:** Used as a drive file to simulate driving conditions for fatigue life testing.

Six Degree of Freedom (DOF) Test System

	Force (kN)	Displacement (+/- mm)	Velocity (m/s)	Moment (kN*m)
<b>X</b>	50	50	1.5	8.1
<b>Y</b>	50*	50	2	120
<b>Z</b>	200	100	1.7	18



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