

Suspension Component Test Rig

DESIGNED TO CHARACTERIZE NOISES, SUCH AS:

- *Strut Pop*
- *"Loose Lumber"*
- *Rebound Noise*
- *Sway Bar & Bushing Noise*
- *Leaf Spring Noise*
- *Noises in Active Dampers/Mounts*
- *Stick-slip Noises*
- *Squeaks & Rattles*

SPECIFICATIONS

- Background Noise: ≤ 2.0 Sones, 13Hz 1.0g pk 3mm p-p sine motion, no test item mounted
- Displacement: 200 mm p-p between stops
- Force, Dynamic: 10.0kN pk instantaneous (2,250 lbf); 2kN pk continuous (450 lbf)
- Force, Compressive, into test item: 13kN pk applied via air actuator (3,000 lbf pk)
- Acceleration, bare table: 22 g's pk instantaneous; 4.25 g's pk sine; 3.0gRMS
- Acceleration, 9kg payload: 18 g's pk instantaneous; 3.6 g's pk sine; 2.5gRMS
- Velocity, ≥ 200 VAC input voltage: > 2.0 m/s instantaneous
- Frequency Response: DC to 100 Hz
- Acceleration control: PSD random, time history, sine – 1.0Hz to 100Hz
- Displacement control: sine, time history – DC to 50Hz
- Force control, dynamic: 1Hz to 100 Hz (with optional force transducer)
- Maximum test item height: 660 mm (26")
- Test space width, between columns: 450mm (18")
- Dimensions, Footprint: 965mm x 616mm (38" x 24.25") and Height: 2.6m (8.7')
- Instrumentation; analog signals available to user: acceleration, velocity, displacement, motor current proportional to excitation force (and load cell force with an optional force transducer and signal conditioner) -- available via BNC for monitoring/acquisition
- Bearings: Air bearings; non-contacting; frictionless; no wear; no stiction; no balls or rollers
- Encoder: Resolution, 1×10^6 pulses/mm; 1V p-p Sine/Cosine analog; incremental
- Height-adjustable crosshead in load frame: Yes, manually adjusted
- Side load applied: Fixture in crosshead allows displacement offsets to top of test item
- Operates with spring & strut: Air actuator compresses spring to curb or design height
- Rig orientation can be vertical or horizontal: Yes

Specifications subject to change without notice



VIEW OF MOTORS & INSIDE FRONT



SUSPENSION COMPONENT TEST RIG



SUSPENSION RIG ASSEMBLY WITH COIL SPRING

OTHER TEST SYSTEM FEATURES

- Quiet – test equipment does not mask test item noises
- No Hydraulics – safe; no high pressure oil; no environmental issues
- Low Maintenance – no seals, servovalves, hoses to replace
- Low Operating Costs – uses power only during excitation
- Control Modes – acceleration, displacement, force; road load time history, PSD random, sine
- Linear Motor Actuator – acoustically quiet, high-fidelity dynamic waveforms
- Air Spring Actuator – high compressive force, durable
- Air Bearings – frictionless motion, low noise
- Operate with environmental chamber

TYPICAL TEST ITEMS

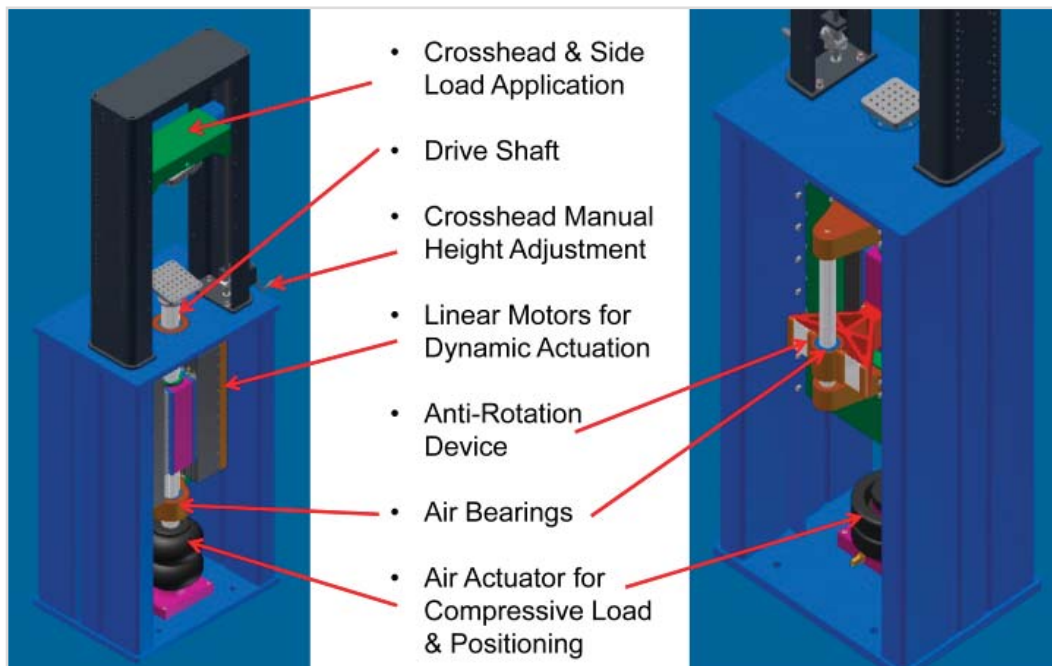


DEPENDS ON FIXTURING

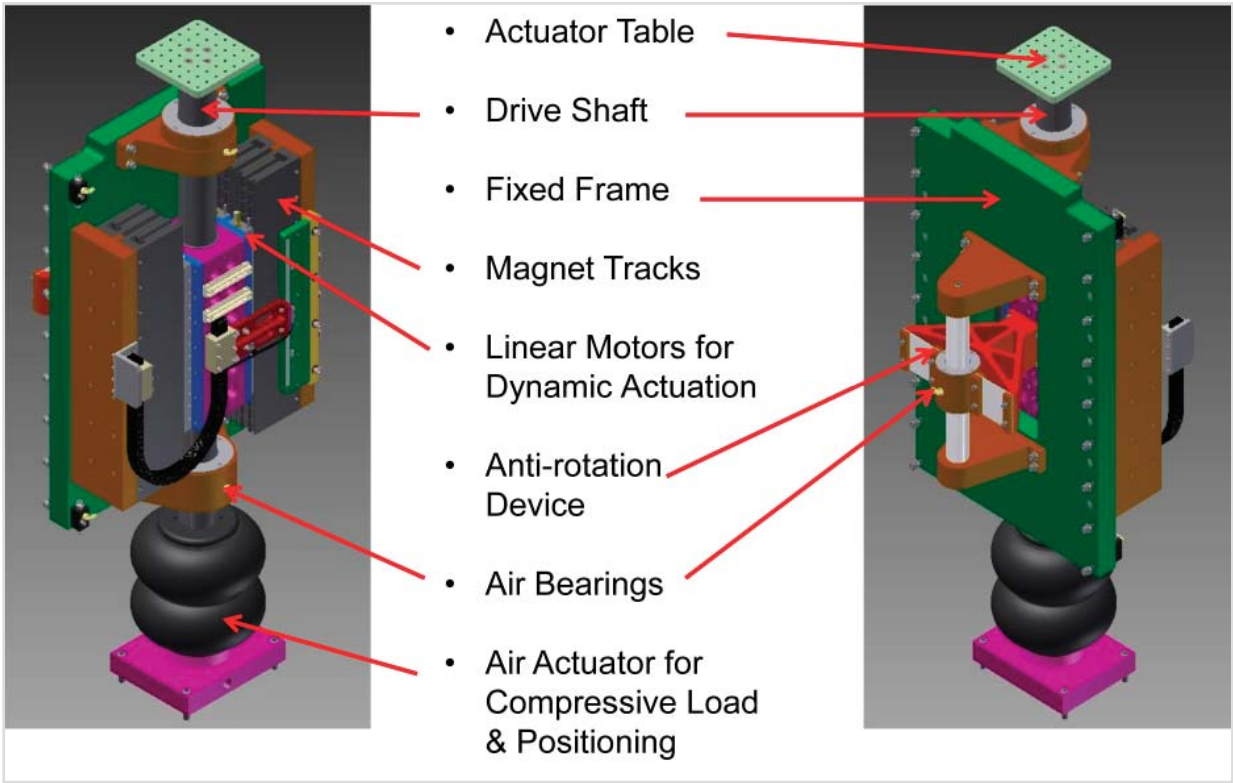
TEST & CONTROL MODES

	ACCELERATION 1 Hz - 100 Hz	DISPLACEMENT DC - 50 Hz	DYNAMIC FORCE 1 Hz - 100 Hz
TIME HISTORY	22 g's pk (bare table) 18 g's pk (9.1kg)	200mm p-p (between stops)	10kN pk
PSD RANDOM	2.0gRMS (bare table) 2.5g's RMS (9.1kg)		1.5kN RMS
SINE	4.25g's pk (bare table) 3.6g's pk (9.1kg)	200mm p-p (between stops)	2.0kN pk

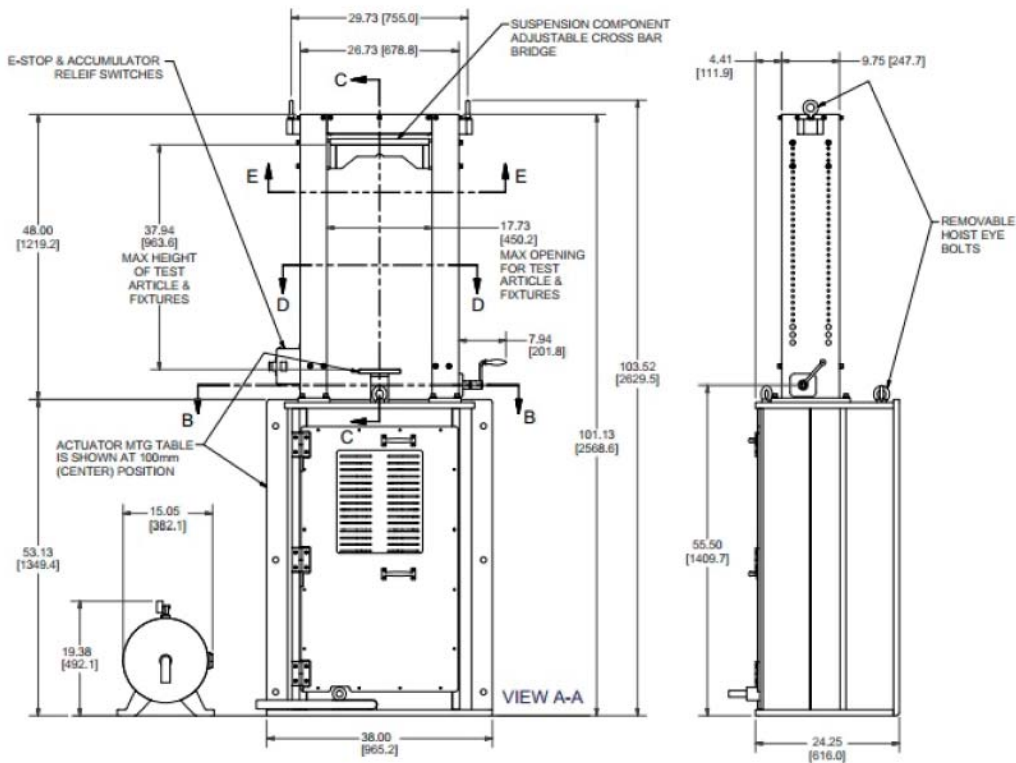
Compressive Force and Starting Position controlled with separate Air Spring control loop



ACTUATOR ASSEMBLY AND LOAD FRAME



EXPLODED VIEW OF ACTUATOR ASSEMBLY



DIMENSIONS AND FACILITIES REQUIREMENTS

Electrical:
200 -- 240 VAC,
3 phase,
50 Amps, 21kVA

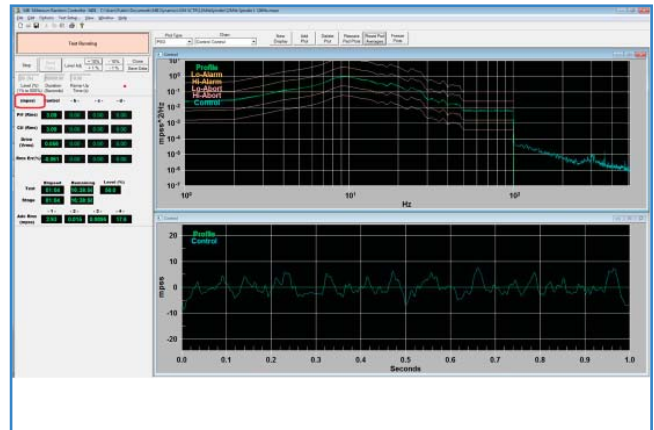
Electrical:
110 -- 220 VAC, 1
phase, 1.7kVA

Air:
90 psi (6bar),
1 CFM
(30 liters/min)

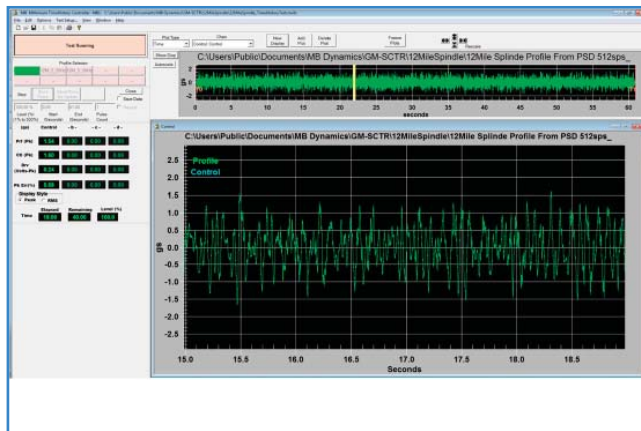
TEST AND CONTROL MODES



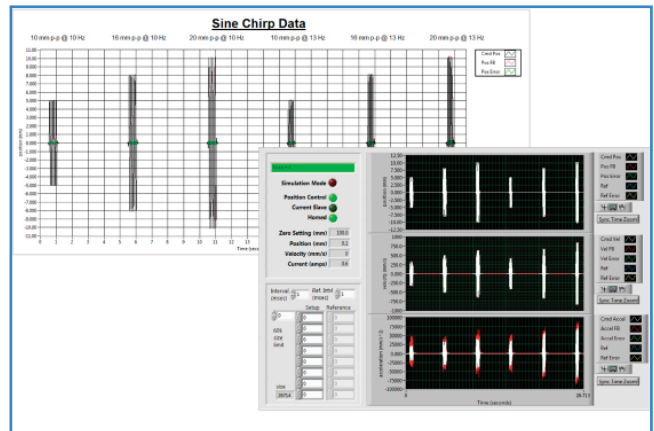
MILLENNIUM CONTROL AND TEST MODES



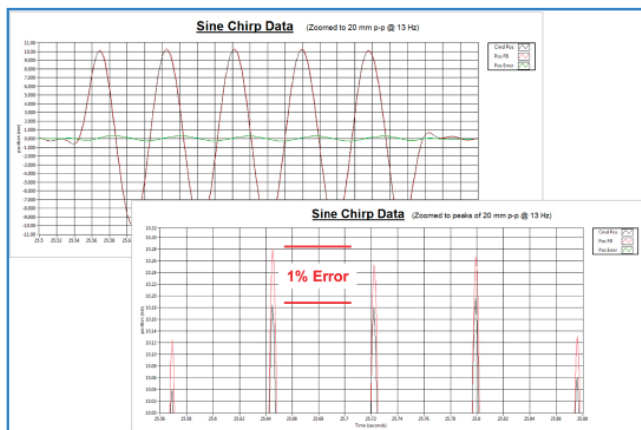
PSD RANDOM ACCELERATION ROAD PROFILE



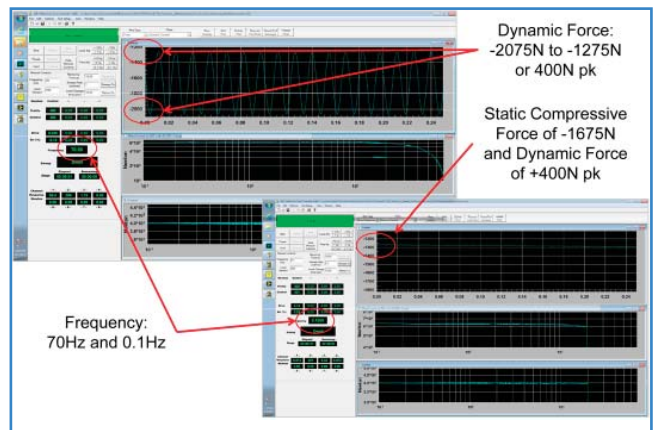
TIME HISTORY ACCELERATION ROAD PROFILE



TIME HISTORY & SINE DISPLACEMENT/POSITION CONTROL



TIME HISTORY & SINE DISPLACEMENT/POSITION CONTROL



SINE FORCE CONTROL, STATIC & DYNAMIC