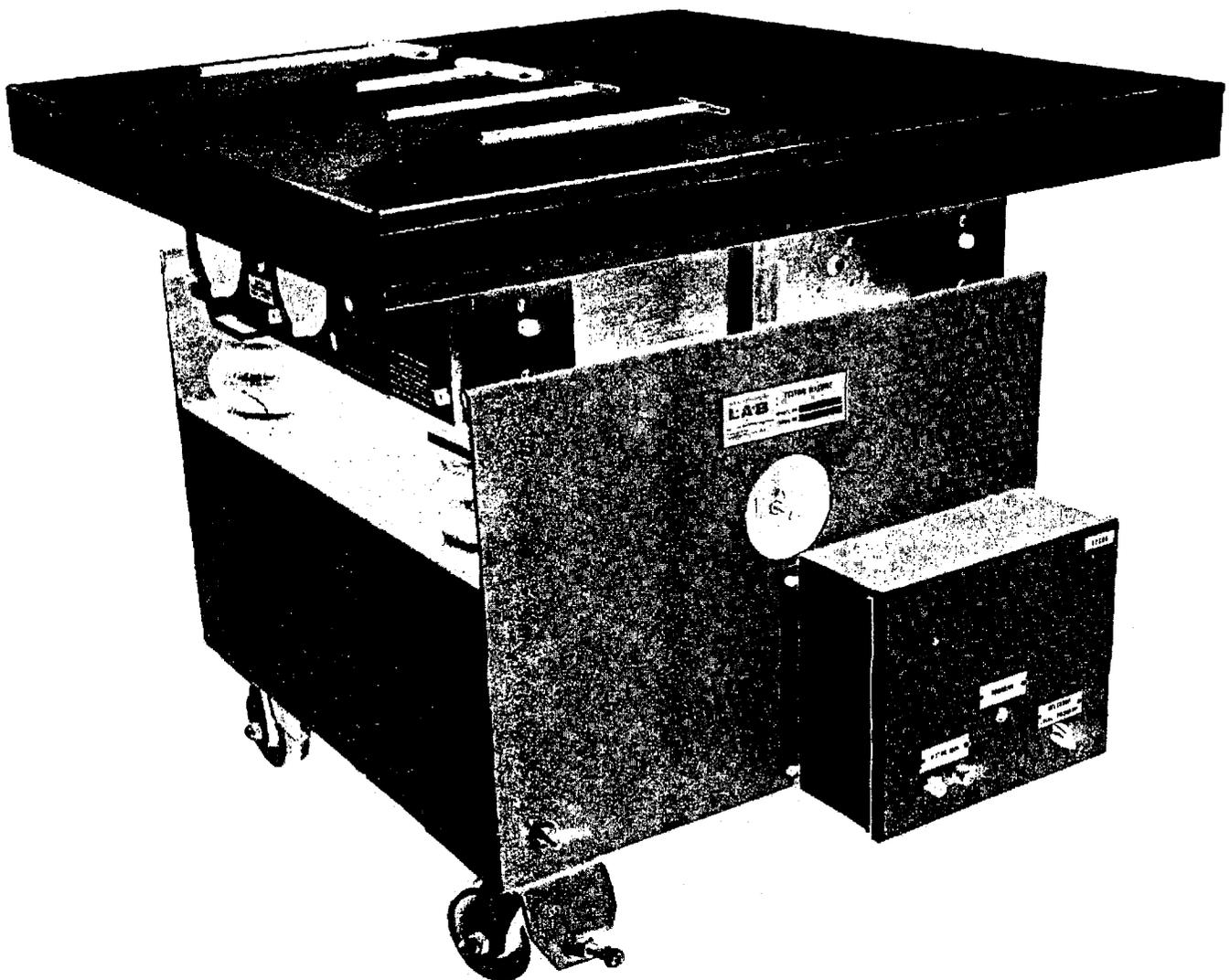




# Advanced Test Equipment Rentals

[www.atecorp.com](http://www.atecorp.com) 800-404-ATEC (2832)

- Product Development
- Reliability and Quality Control Testing
- Vibration Fatigue Testing
- Burn-in and Product Testing
- AGREE, MIL-STD-781



# Vibration Testing Machines

---

## Benefits/Design Features

- **Convenient** — large load capacities
  - **Low Cost for Reliability Vibration Testing**
  - **Adjustable** — frequency may be adjusted while running
  - **Time-Saving** — amplitude and direction of vibration adjustable in less than two minutes
  - **Low Maintenance** — grease lubricated sealed bearings, easy belt replacement
  - **Ease-of-Use** — remote controls and OSHA failsafe starters
  - **Insulated Table Tops** — isolate table heat loads from chambers
  - **No Foundations Required** — pneumatic suspensions
  - **Single and Two Direction Models Available**
  - **Easy to Move** — casters and tracks available
  - **Versatile** — interface with all makes of environmental chambers
- 

## Operation

These are reaction type vibration machines which produce sinusoidal wave forms of displacement which do not become distorted due to wear in the bearings. No foundation is required for their installations.

## Tables

The tables are fabricated of high strength aluminum alloy with at least six ribs of equal depth to provide a rigid support of the load mounting surface. The bearings which carry the vibration generator shafts are flange mounted on the two center ribs, transmitting force directly to the table top. No base mounted bearings mounted on beam type supports which can deflect and cause distortion in the table are used. All bearings are grease lubricated and sealed for long operating life.

## Insulated Tops

When used with a hood type environmental chamber, the table top forms a vibrating floor in the chamber for combined temperature and vibration tests. The table can be of sandwich construction with two aluminum plates separated by 1½" thick foam insulation and hard spacers. Tapped mounting holes are provided in the upper table surface for mounting of the test load.

## Vibration Generators

Semi-circular steel eccentric weights, one-half of which are fixed and the other half adjustable on counter rotating shafts, produce the vibratory motion of the table. Each unbalanced mass produces a centrifugal force vector which rotates through 360° for each shaft revolution. Counter rotation causes these forces to combine into a single vector which reverses direction and magnitude sinusoidally in whichever direction the machine is set to vibrate. Vertically vibrating machines have only two counter rotating generator shafts. Two direction machines have four counter rotating shafts whose phase relationship can be altered to produce vibration in both the vertical and horizontal directions. Force couple compensation is employed in the two direction machines to balance load moments when vibrating horizontally.

The edge on a fixed weight of each shaft is marked from 0 to 10 to represent percent of maximum generator moment. An index on the adjustable weights permits making moment settings with accuracy since the full length of the weight's rim is utilized as the scale.

Timing belts are readily replaceable between the counter rotating shafts. A removable rim on one of the timing belt sprockets allows replacement of belts without changing the center distance between the shafts. This assures the proper belt tension is maintained at all times. It is not necessary to adjust shaft position to replace belts.

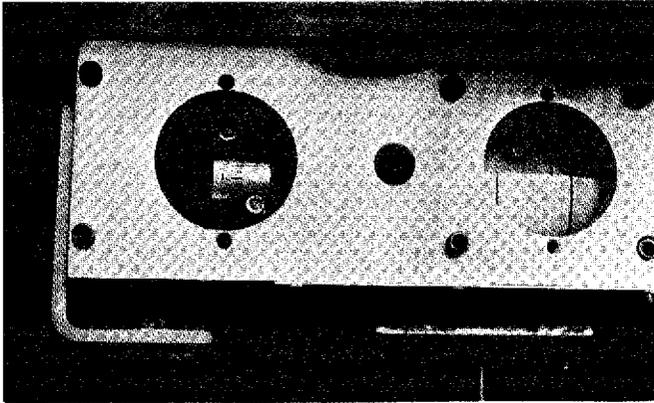
*On the cover: Model BRFCCP 36-500 with insulated table top, v-groove casters and WD129 controls.*

# Quality Testing Machines Since 1933

---

## Force Couple Compensation (FCC)

This is a technique of vectoring the force output of the four shaft vibration generators when vibrating horizontally to compensate for the moment of the test load above the center of force. The center of force is below the load mounting surface and the force vectors are therefore applied along a horizontal base line to balance the moment of the test load. Displacement ratings given in the specifications apply to vertical and horizontal vibration without FCC. When FCC is applied for horizontal vibration, part of the generator moment is used for the force couple, thus reducing the maximum horizontal displacement available. Specific data on each model is available on request.



*FCC adjustment on left. Displacement setting access center.*

## Suspension

The suspension system of each machine employs pneumatic springs to isolate table vibrations from the supporting structure and the floor. Reaction type machines can be operated on upper floors of multiple story buildings without any special foundation. The natural frequency of the suspension system is approximately 2 Hz. and remains the same regardless of load on the table. No helical springs are used which can change frequency under load and are subject to inter-resonances and instability due to top loading.

## Casters

V groove casters with wheel locks and tracks in 5 ft. sections are available for preserving the alignment of the table beneath a hood type chamber. Flat wheel casters are also available.

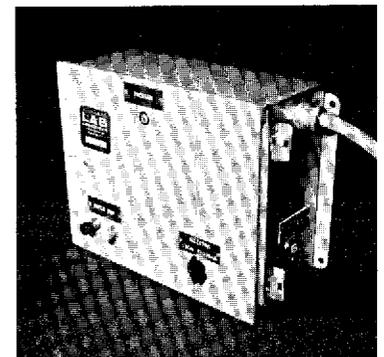
## Drives

Basic machines are supplied with AC 3 phase electrical motors and variable speed pulleys that are adjustable while running. Speed is infinitely adjustable by inserting a T-handle wrench through the side of the machine to operate the speed adjustment screw. Frequency range 20 - 60 Hz.

Direct current variable speed drives with SCR controls are also available as optional equipment to cover from 8 to 60 Hz. Speed control is by means of a potentiometer on the control panel. Machines with DC drives are also available with automatic cycling devices which sweep frequency at linear rates. Standard rate is approximately 1.2 Hz. per second to 2.5 Hz. per minute. Frequency limits are also adjustable to sweep selected segments of the machine's full range.

## Motor Controllers

Basic machines are supplied with electro-magnetic starters when only manual stop-start controls are used at the machine. Used in conjunction with timers are WD-129



*Basic WD-129 controls with local and program selector switch.*

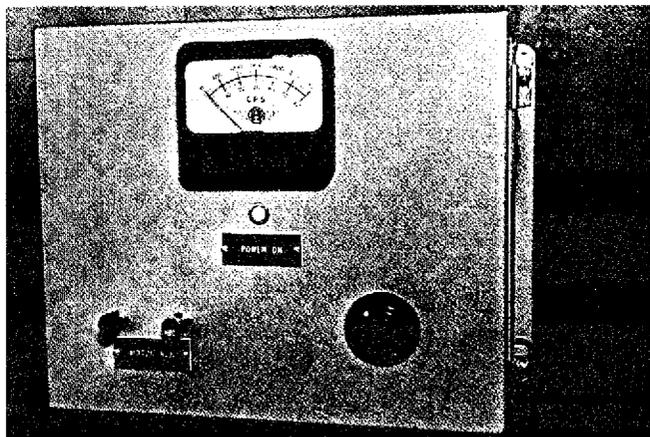
motor controllers with memory relay. The memory relay prevents inadvertent restarting of a machine after a power interruption. An operator must deliberately reprogram the machine to operate before it will function. This is an important safety feature recommended for all machines being operated by timers.

# Vibration Testing Machines

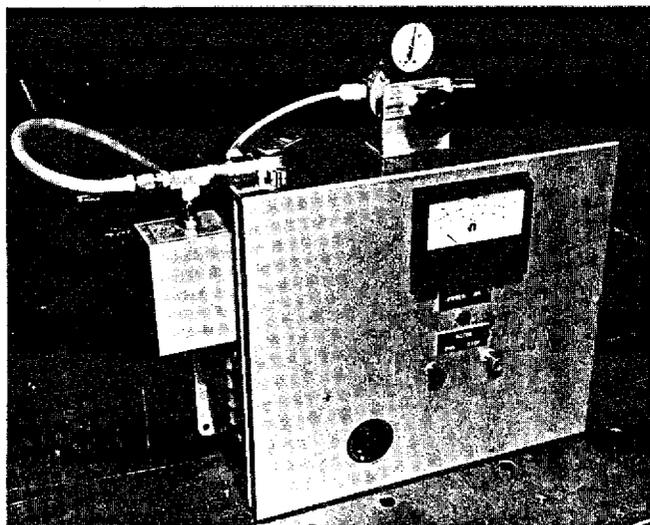
## Motor Controllers (continued)

Cam timers to operate 10 minutes per hour or resettable predetermining counters are also available.

L.A.B. also builds heavy-duty vibration machines with all steel table frames, counterweights, and gear-driven vibration generators. Ask for literature on our RVH series.



DC motor controls and frequency meter.



Air manifold on control box to raise and lower table during loading. Interlocked with motor starter.



Frequency adjustment on AC drive machine.

## VERTICAL VIBRATION

TABLE SIZE Inches (cm.)	LOAD LBS. (Kgs.)		EXCURSION, INCHES (mm.)		BASIC MODEL ②
	①	I	II		
18 x 18" (46x46 cm.)	50 lbs. (22Kg.)	.120" (3.0mm.)	100 lbs. (45Kg.)	.080" (1.8mm.)	BRVP-18
24x24" (61x61cm.)	100 lbs. (45Kg.)	.070" (1.8mm.)	200 lbs. (90Kg.)	.050" (1.3mm.)	BRVP-24
24x72" (61x183cm.)	500 lbs. (230Kg.)	.100" (2.5mm.)	1000 lbs. (455Kg.)	.070" (1.8mm.)	BRVP-24x72
30x30" (76x76cm.)	200 lbs. (90Kg.)	.110" (2.7mm.)	300 lbs. (140Kg.)	.090" (2.2mm.)	BRVP-30
30x48" (76x122cm.)	300 lbs. (140Kg.)	.090" (2.2mm.)	500 lbs. (230Kg.)	.070" (1.8mm.)	BRVP-30x48
36x36" (91x91cm.)	300 lbs. (140Kg.)	.080" (2.0mm.)	500 lbs. (230Kg.)	.070" (1.8mm.)	BRVP-36
48x48" (122x122cm.)	500 lbs. (230Kg.)	.100" (2.5mm.)	1000 lbs. (455Kg.)	.070" (1.8mm.)	BRVP-48
48x66" (122x168cm.)	500 lbs. (230Kg.)	.110" (2.7mm.)	1000 lbs. (455Kg.)	.080" (2.0mm.)	BRVP48x66
48x72" (122x183cm.)	1000 lbs. (455Kg.)	.100" (2.5mm.)	1500 lbs. (680Kg.)	.070" (1.8mm.)	BRVP-48x72
48x96" (122x244cm.)	1000 lbs. (455Kg.)	.100" (2.5mm.)	2000 lbs. (909Kg.)	.070" (1.8mm.)	BRVP-48x96
60x60" (152x152cm.)	1000 lbs. (455Kg.)	.100" (2.5mm.)	2000 lbs. (909Kg.)	.070" (1.8mm.)	BRVP-60
60x96" (152x244cm.)	1000 lbs. (455Kg.)	.100" (2.5mm.)	2000 lbs. (909Kg.)	.070" (1.8mm.)	BRVP-60x96
96x144" (244x305cm.)	-	-	-	-	-

## Notes

The letter designation represents a series of machines, in this case "B" series.

"R" means they are reaction types and require no foundation for installation.

"V" & "H" indicates direction of vibration — either vertical or horizontal.

"FCC" applies to the larger two direction machines with force couple compensation.

"P" signifies a pulley drive, (20 to 60 Hz.)  
and

"D" signifies DC drive (8-60 Hz.).

# Quality Testing Machines Since 1933

## VERTICAL & HORIZONTAL VIBRATION (Horizontal Shake is in Direction of Longer Table Axis)

## MODIFICATIONS AND OPTIONS AVAILABLE

LOAD LBS.	EXCURSION, INCHES		BASIC MODEL <sup>③</sup>	MOD. 1		MOD. 2		MOD. 3	MOD. 4	Approx. Shipping Wt. Lbs. (Kgs)
	I	II		DC Drive with SCR Controls & Frequency Meter 3.2 Max. V only	8-60 Hz. V&H	10G Max. V only <sup>⑥</sup>	V&H	Hood Type Chamber Kit <sup>⑤</sup>	Horizontal in Direction of Shorter Table Axis	
-	-	-	-	BRVD-18	-	Yes	-	-	-	300 (136)
100 lbs. .100"	200 lbs. .070"	BRVHP-24	BRVD-24	BRVHD-24	Yes	Yes	Yes	-	-	310 (140)
500 lbs. .100"	1000 lbs. .070"	BRVHP-24x72	BRVD-24x72	BRVHD-24x72	-	-	Yes	No	-	1000 (455)
200 lbs. .080"	300 lbs. .070"	BRFCCP-30	BRVD-30	BRFCCD-30	Yes	Yes	Yes	No	-	580 (263)
300 lbs. .100"	500 lbs. .070"	BRFCCP-30x48	BRVD-30x48	BRFCCD-30x48	-	Yes	Yes	No	-	850 (386)
300 lbs. .100"	500 lbs. .080"	BRFCCP-36	BRVD-36	BRFCCD-36	Yes	Yes	Yes	-	-	670 (304)
500 lbs. .100"	1000 lbs. .100"	BRFCCP-48	BRVD-48	BRFCCD-48	-	Yes	Yes	-	-	1000 (455)
1000 lbs. .100"	1500 lbs. .070"	BRFCCP-48x66	BRVD-48x66	BRFCCD-48x66	-	-	Yes	Yes	-	1200 (545)
2000 lbs. .100"	3000 lbs. .080"	BRFCCP-48x72	BRVD-48x72	BRFCCD-48x72	-	-	Yes	Yes	-	1500 (681)
2000 lbs. .100"	3000 lbs. .070"	BRFCCP-48x96	BRVD-48x96	BRFCCD-48x96	-	-	Yes	No	-	2000 (909)
1000 lbs. .100"	2000 lbs. .070"	BRFCCP-60	BRVD-60	BRFCCD-60	-	-	Yes	-	-	1700 (773)
2000 lbs. .120"	3000 lbs. .100"	BRFCC-60x96	BRVD-60x96	BRFCCD-60x96	-	-	Yes	Yes	-	2100 (954)
6000 lbs. .120"	-	BRFCCP-96x144	-	-	-	-	Yes	-	-	7000 (3182)

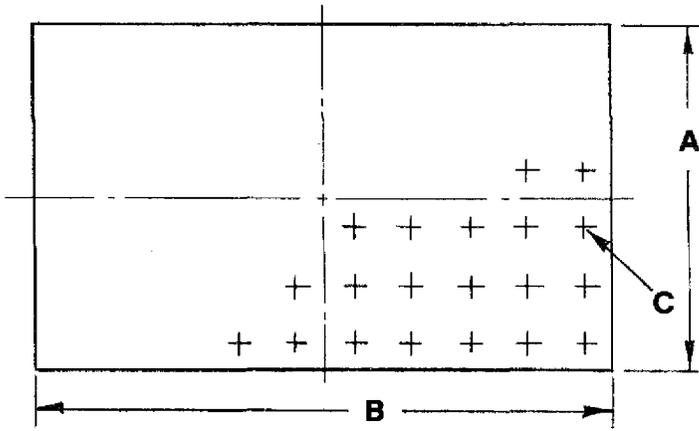
The numbers indicate table size and load rating.

- ① Most models have dual ratings of load and excursion, I & II. At lighter loads they will produce larger excursions and vice versa. Standard acceleration is 3.2G. See acceleration curve for frequency and displacement limits. Ratings include allowance for weight of insulated table tops. Add load rating to model designation.
- ② Standard frequency range is 20 - 60 Hz. adjustable while running by variable speed pulleys. DC drives for 8-60 Hz. available as options. Replace "P" with "D" where DC drive is preferred.
- ③ Vibration is in both vertical and horizontal directions. Changing direction in less than two minutes while stopped. FCC is included on the larger models.

- ④ All DC drive models are wired for 230 volts and are available with an automatic cycling device to sweep frequency at adjustable linear rates. The sweep limits are also adjustable.
- ⑤ When used with hood type AGREE chambers, shakers are available with sandwich construction insulated table tops, diaphragm supports, V groove casters and tracks plus motor controllers to operate from the chamber timer. Machines may also be used in walk-in chambers — -20° to -130°F. exposure without special components for 10 minutes of each hour.
- ⑥ All 10G rated machines have externally mounted motors. See outline drawing and photos on next page.

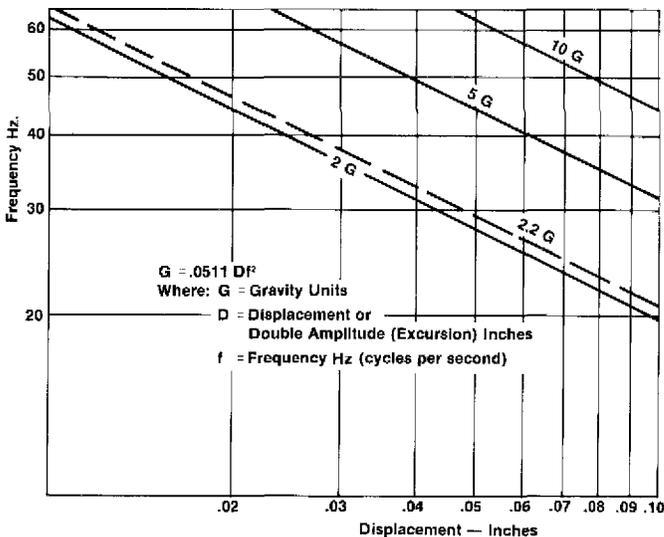
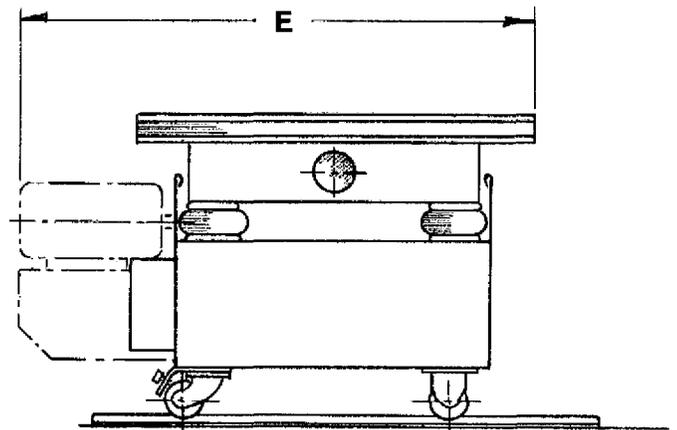
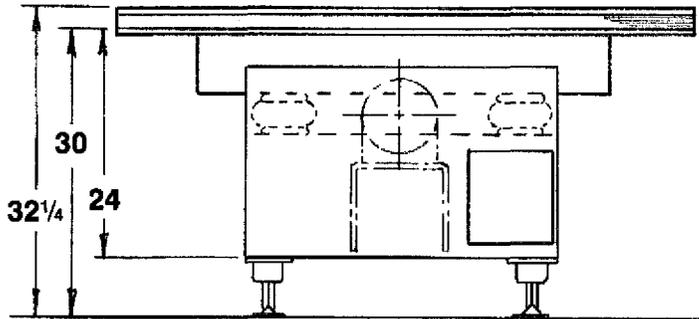
# Vibration Testing Machines

## Dimensions



3/8-16 Tap, on D centerlines

TABLE	SIZE	NO. OF HOLES		SPACING	DIM. OVER EXTERNAL MOTOR
		SIZE	SPACING		
A	B	C		D	E
18	18	36	1/4-20	3	28
24	24	36	3/8-16	4	35
24	72	48	3/8-16	6	—
30	30	36	3/8-16	5	41
30	48	40	3/8-16	6	47
36	36	36	3/8-16	6	44
48	48	64	3/8-16	6	63
48	66	80	3/8-16	6	—
48	72	96	3/8-16	6	—
48	96	32	3/8-16	12	—
60	60	25	3/8-16	12	—
60	96	40	3/8-16	12	—
96	120	80	3/8-16	12	—



# L.A.B. Testing Systems

## Technical Services

L.A.B. maintains operational systems which can be used at any time for demonstration of capability or operational training. We invite you to take advantage of these systems to become more familiar with the outstanding features of the L.A.B. Testing Systems.

## Turnkey Installation

L.A.B. can provide complete turnkey system responsibility. This may include the system, complete controls, reaction mass, site preparation, special fixturing, and other contractor interface, e.g., temperature chambers.

## Installation and Training

L.A.B. can direct the installation of all systems and perform the system checkout. A training program is available to provide users with the knowledge and confidence to operate their systems. A complete owner's manual is provided with each system.

## Field Service

L.A.B. has a complete staff of field service engineers who provide repairs, maintenance, and service contracts in an economical, timely manner.

L.A.B. Testing Systems have been testing products and packages for over 50 years. All L.A.B. equipment complies with NSTA, ASTM, MIL SPEC, TAPPI, DOT, and Federal recommendations. L.A.B. is the industry's **exclusive** supplier of mechanical and hydraulic test systems in both standard and custom configurations:

- Servo-Controlled Compression Testers
- Mechanical Transportation Simulators
- Vertical and Horizontal Servo-Hydraulic Vibration Systems
- Programmable Shock Machines
- Drop Testers
- Incline Impact (Conbur)/Humping Simulators
- Mechanical Reliability Shakers (AGREE)

Mechanical Technology Incorporated, L.A.B.'s parent company, generates and employs, as its principal competitive resource, an ever-broadening base of technology which has developed over a period of more than 25 years. The company's progress has been made possible by the technical expertise and capabilities of its Technology Group.

Other manufacturers in MTI's Products Group include:

**INSTRUMENTS DIVISION:** noncontact dimensional measuring equipment

**KIMBALL INDUSTRIES:** vibration slip tables and magnesium fixtures

**LING ELECTRONICS, INC.:** electrodynamic and acoustic vibration systems

**ST. CLAIR METAL PRODUCTS COMPANY:** automotive trim and metal stampings

**TURBONETICS ENERGY, INC.:** high-efficiency steam turbines and waste energy recovery systems

**UNITED TELECONTROL ELECTRONICS, INC.:** defense electronics



L.A.B. Onondaga Street Skaneateles, New York 13152 U.S.A.  
Telephone 315-685-5781 TLX 6974664 LAB UW FAX 315-685-8106