THE MODAL SHOP
AN AMPHENOL COMPANY

MODEL **2050A**

LATERAL EXCITATION STAND

- Ensures proper shaker alignment with coarse and fine vertical adjustment
- Optimizes stinger length with horizontal adjustment
- Decouples shaker motion from dynamics of stand
- Reduces force sensor measurement error with “piano wire” stinger

TYPICAL APPLICATIONS

- Experimental modal analysis
- Automotive body-in-white testing
- Structural testing of aerospace and automotive sub-assemblies

INPUT LATERAL FORCE

The Lateral Excitation Shaker Stand Model 2050A provides a versatile means of adapting a modal shaker for horizontal input. Automobiles, aircraft, space structures, and civil structures often require a means of inputing lateral force. The stand facilitates excitation with a tensioned “piano wire” stinger (optional accessory) which significantly reduces force measurement errors from unmeasured transverse forces. Combining both lateral and vertical excitation more evenly distributes input energy for better signal to noise levels, and helps to excite uncoupled lateral structural modes. The shaker location can now be precisely adjusted in both the horizontal and vertical directions.

Lateral excitation is important when testing large structures or ones in which the transverse modes are highly uncoupled. In either case it is desirable to implement multiple inputs. A vertical input and the addition of a well chosen point for a lateral or skewed input can usually provide sufficient input energy and excite all the modes in a desired frequency range. The 2050A stand provides the ideal support and adjustment for such a configuration, typically using 25 lbf to 100 lbf modal shakers. The resulting input force of two or more shakers provides a broader distribution of the total input energy and helps to ensure adequate signal levels at all measurement points.

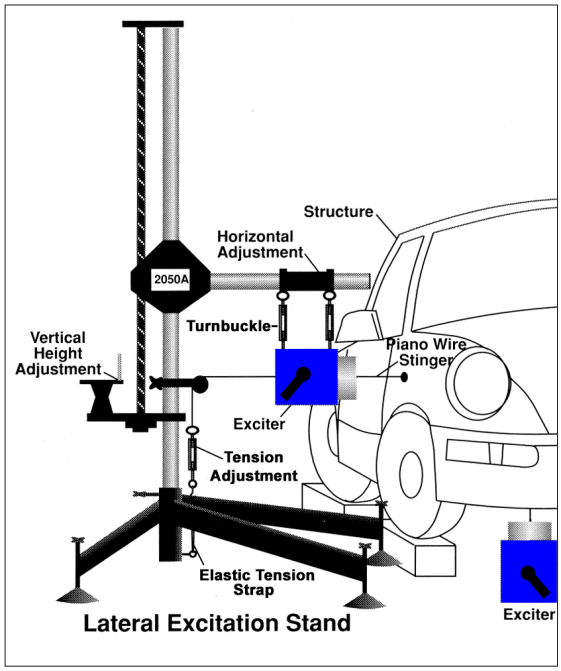
CE

SPECIFICATIONS		
Performance		
Vertical Adjustment Range		
Coarse	4 in to 49 in	10.2 cm to 124.5 cm
Fine	±2 in	±5 cm
Horizontal Adjustment	0 in to 13.5 in	0 cm to 34.3 cm
Maximum Support Load	160 lb	72.7 kg
Dimensions (L x W x H)	39 in x 49.5 in x 75 in	99 cm x 126 cm x 191 cm
Weight	120 lb	54.5 kg
Materials	Aluminum, Steel, Delrin	
Tensioning Method	Elastic Strap / Turn Buckle	
Included Accessories		
2000X07	(4) 6 in (152 mm) rubber strap with steel hooks	
Optional Accessories		
2100	Series Excitation Stingers	
288D01	Impedance Head	
2060E	60 lbf Modal Exciter	
2025E	25 lbf Modal Shaker	
2050E05	Shaker Amplifier	
2100E21-400	Shaker Amplifier	
8032S	AirRide Test Structure Support	
2100E13	Modal Accessory Kit	
2100E20	Bolt-on inertial masses, quantity 2, for the 2100E11 Modal Shaker, requires 2100E13 Modal Accessory Kit	
K2160G	Piano Wire Stinger Kit	

LATERAL EXCITATION STAND TESTING

Capitalizing on the unique through-hole armature design used on modal shakers, lateral input excitation can be imparted using the 2050A over a tensioned wire stinger. A wire stinger transmits forces solely in the axial direction and does not input side loads to the structure. Off-axis side loads, which can be transmitted by rigid connection mounts, are not measured by uniaxial reference force sensors. These forces which enter a test structure, and are not measured as input, add noise to the measurement process. The optimum axial force transmission delivered by the tensioned wire increases the accuracy of the measurement process.

The wire stinger can be used to tension structural subcomponents to simulate operating conditions or reduce nonlinearities due to subcomponent clearance rattles. If tensioning of the forcing point is not desired, or if a quicker mount is desired, the shaker can still be connected with a conventional stinger. By suspending the exciter from pivots, the stand effectively decouples the inertial excitation force. This prevents dips in the force spectrum that occur when the stand's resonances are excited.



Typical Installation

2050A shown with optional Piano Wire Stinger Kit

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