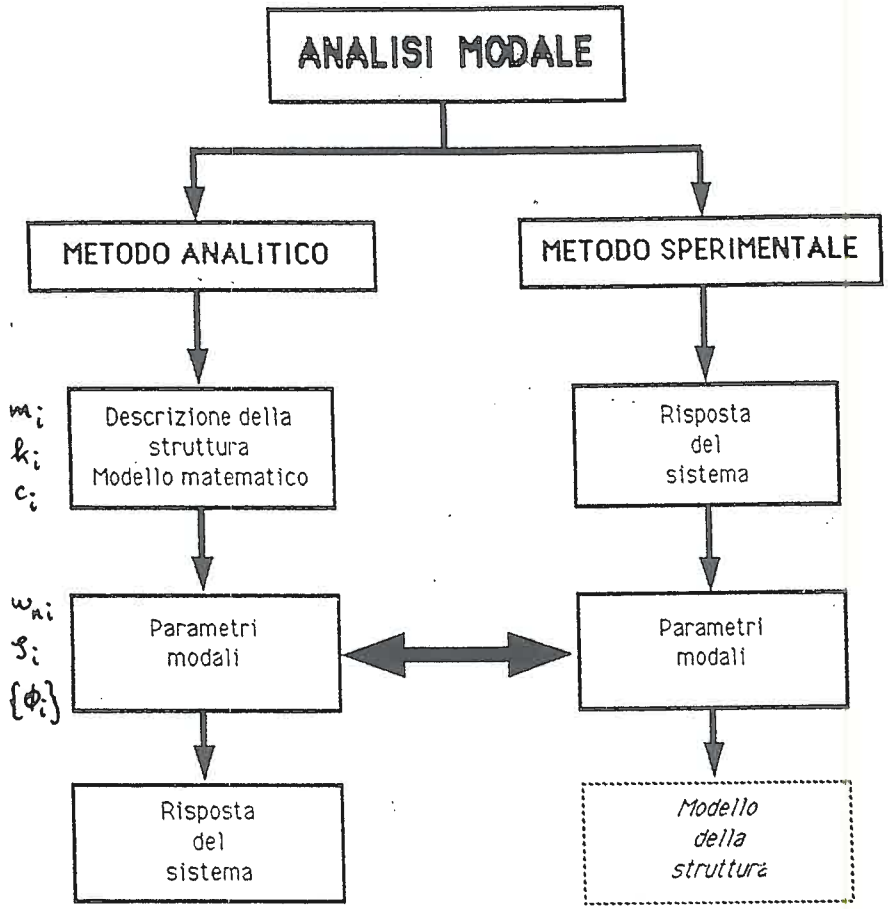
Fotocopie dei trasparenti:

ANALISI MODALE SPERIMENTALE



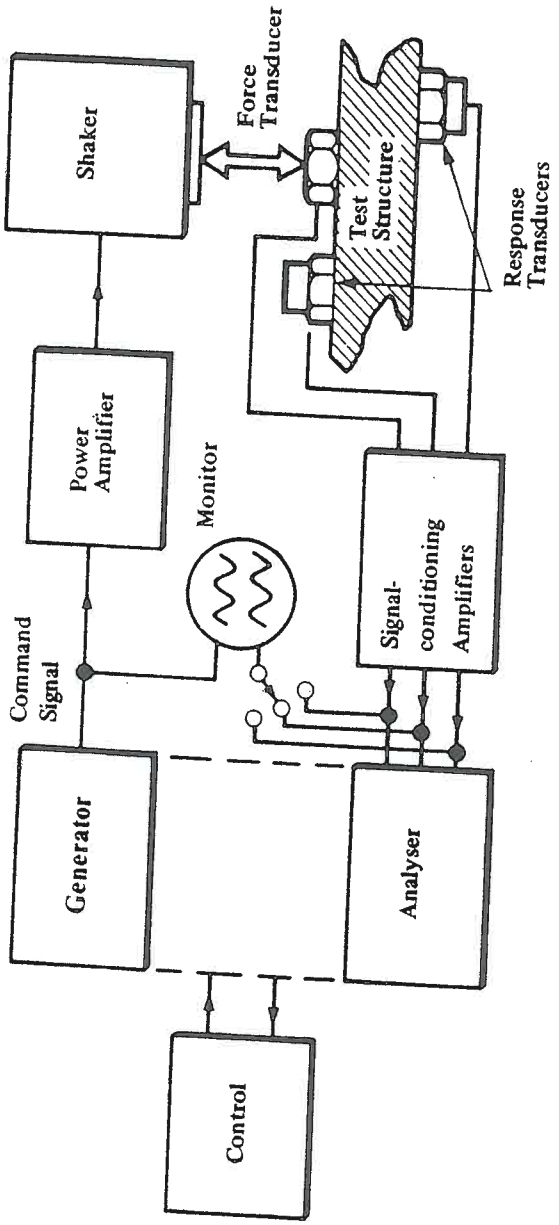


Fig 3.1 General Layout of Mobility Measurement System

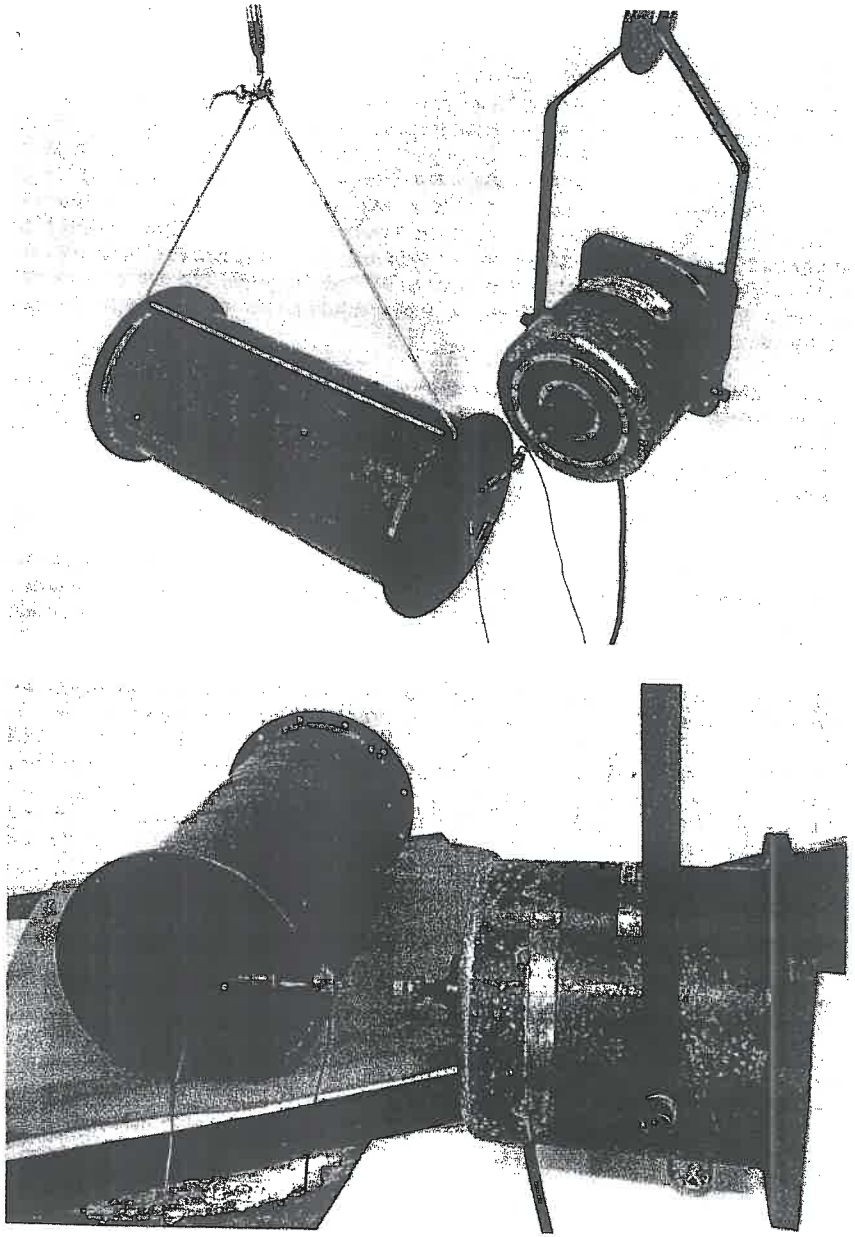


Fig 3.2b Examples of Freely-Supported Structures

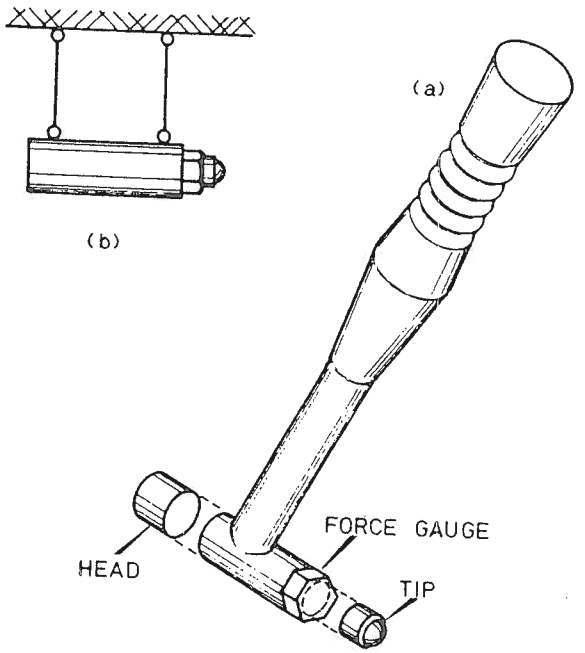


Fig 3.7 Impactor and Hammer Details

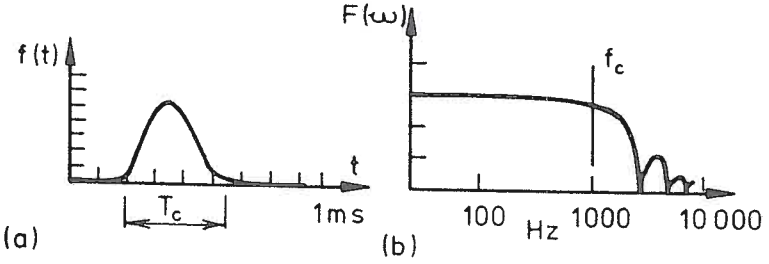
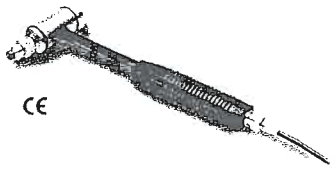


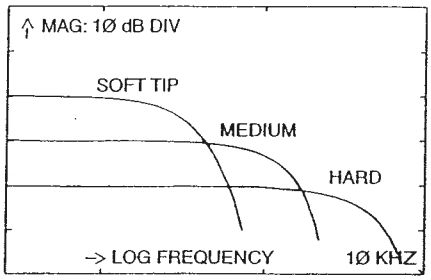
Fig 3.8 Typical Impact Force Pulse and Spectrum
(a) Time History
(b) Frequency Spectrum

Modally Tuned ICP® Impact Hammers

Model 086C05 - tests medium to heavy structures such as machine tools, light trucks, at low to medium frequencies.

- 5 kHz frequency range
- 5000 lb amplitude range
- 1 mV/lb sensitivity
- 1 lb hammer mass
- 1 inch head diameter

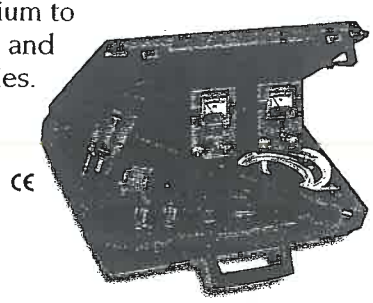


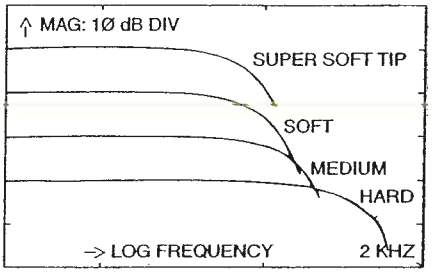


Model 086C05
(shown with cable attached)

Model 086C20 - small sledge, tests medium to heavy structures such as tool foundations and storage tanks at low to medium frequencies.

- 1 kHz frequency range
- 5000 lb amplitude range
- 1 mV/lb sensitivity
- 3 lb hammer mass
- 2 inch head diameter

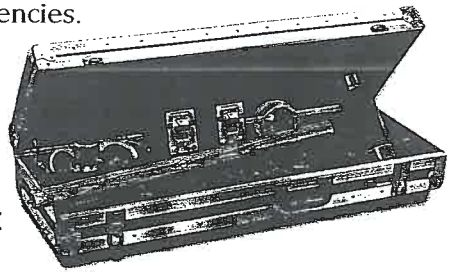


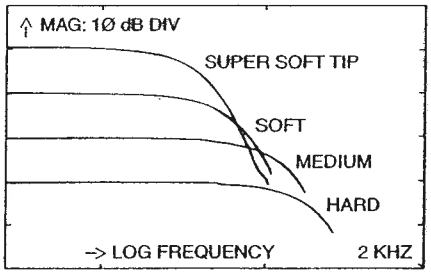


Model 086C20
(shown in Model GK291D20 kit)

Model 086C50 - large sledge, tests very heavy structures such as buildings, locomotives, ships, and foundations at low to very low frequencies.

- 500 Hz frequency range
- 5000 lb amplitude range
- 1 mV/lb sensitivity
- 12 lb hammer mass
- 3 inch head diameter

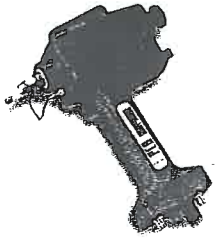


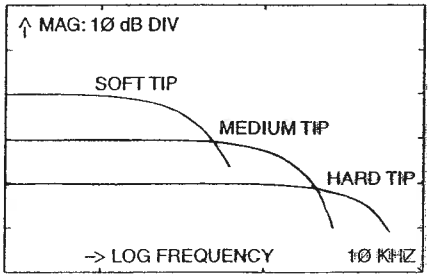


Model 086C50
(shown in Model GK291D50 kit)

Model 086C09 - electric solenoid actuated, for general purpose use, when controlled, repeatable impulse force is required such as with production testing.

- 8 kHz frequency range
- 1000 lb amplitude range
- 10 mV/lb sensitivity
- 0.6 inch head diameter
- local and remote trigger





Model 086C09

Mini-Shaker

type 4810

FEATURES:

- Force rating 10 Newton (2,25 lbf) Sine Peak
- Frequency range DC to 18 kHz
- First axial resonance above 18 kHz
- Max. bare table acceleration 550 ms^{-2} (56 g)
- Rugged construction

USES:

- Calibration of accelerometers
- Vibration testing of small objects
- Educational demonstrations
- Mechanical impedance measurements

The Mini-Shaker Type 4810 is a small machine for the dynamic excitation of lighter objects, it is manufactured from quality materials to a high degree of precision and has proved to be a reliable and versatile tool in dynamic testing.

Type 4810 is well suited as the motive force generator in mechanical impedance measurements where only smaller forces are required. It can also be used in the calibration of vibration transducers, both to determine their sensitivity by comparison with a standard accelerometer, and to determine their frequency response up to 18 kHz.

The Mini-Shaker is of the electrodynamic type with a permanent field magnet. A coil, which is an integral part of the table structure, is flexibly suspended in one plane in the field of the permanent magnet. An alternating current signal, provided by an external oscillator is passed through the coil to produce a vibratory motion at the table. A sectional drawing illustrating the method of construction is shown in Fig. 1.

The suspension system consists of radial flexure springs which restrict the moving element to almost perfectly rectilinear motion. Laminated flexure springs provide a high degree of damping to minimize distortion due to flexure resonances. The frequency response curves shown in Fig.2 show the highly damped flexure resonance around 50 to 60 Hz.

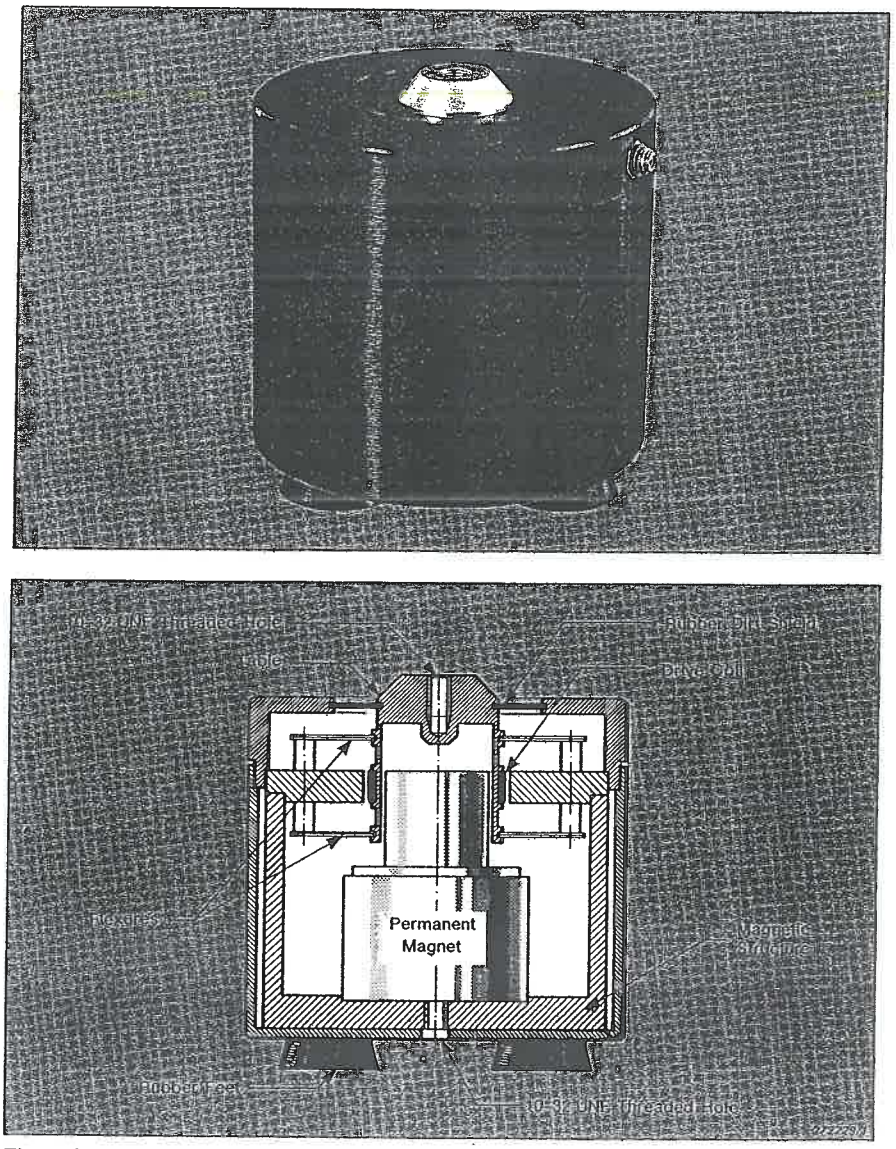


Fig. 1. Sectional drawing of the Mini-Shaker Type 4810

The object to be vibrated is attached to the table by means of a 10 – 32 UNF screw; the thread size commonly used for mounting accelerometers. Performance limits which are defined by the maximum displacement (6 mm), maximum force (10 N or 7 N depending on frequency), and the first axial resonance of the moving element (above 18 kHz), are graphically shown in Fig.3.

Within these limits, the attainable acceleration can be determined by the expression.

$$a = \frac{F}{W}$$

where a = acceleration in ms^{-2} ($1\,ms^{-2} = 0{,}102\,g$)
F = shaker rated force in Newtons
W = exciter moving element weight + test object weight in kg

Examples of maximum test object weight for accelerations of 20 g and 5 g are drawn in on the curve.

In order to attain full rated output force from the 4810 it should be driven by Power Amplifier Type 2706. This is a power amplifier specially designed to drive small vibration exciters and has a current limiter to prevent overdriving the 4810.

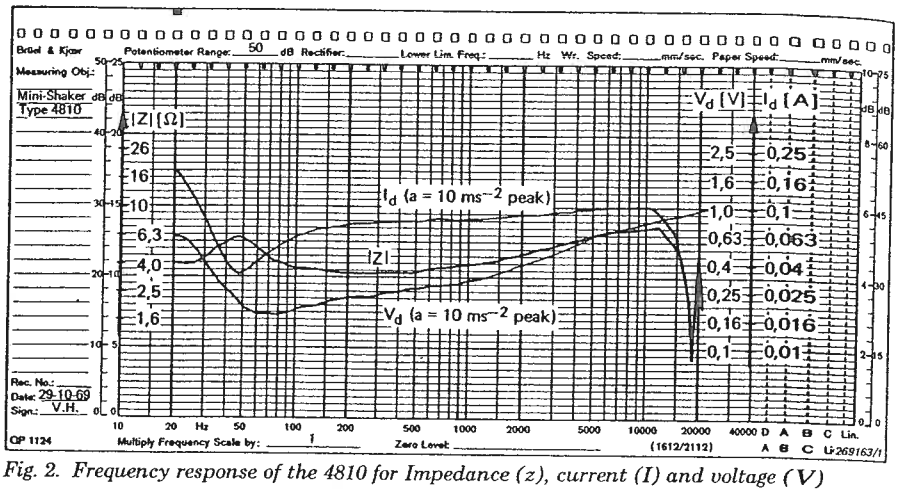


Fig. 2. Frequency response of the 4810 for Impedance (z), current (I) and voltage (V)

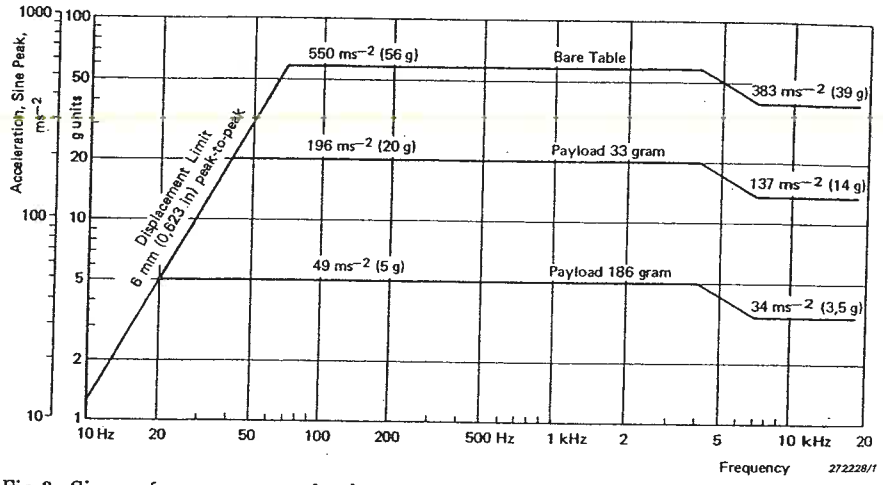
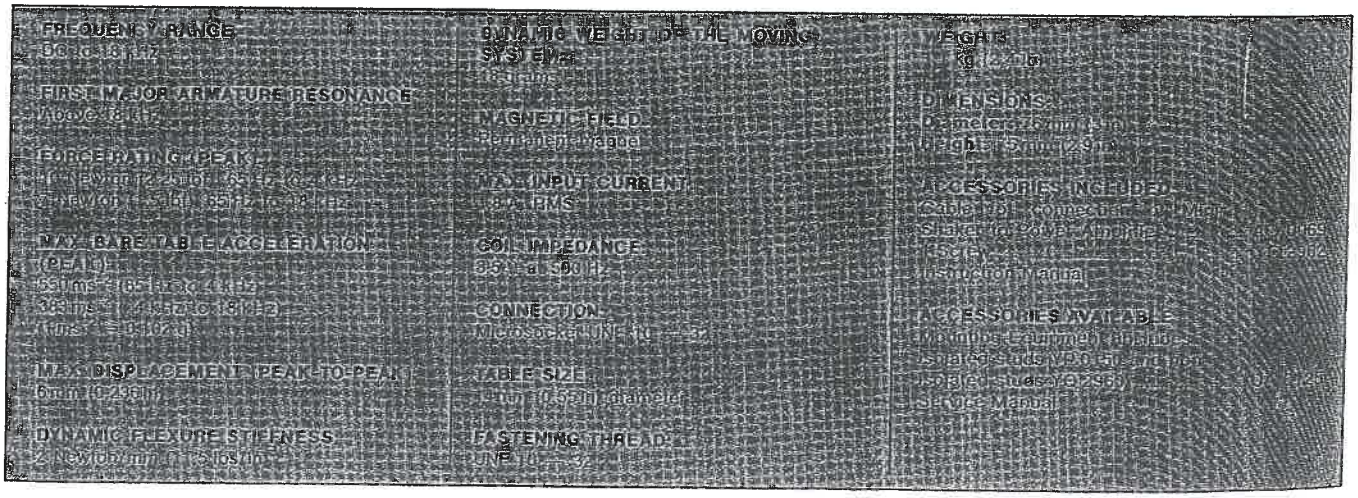


Fig. 3. Sine performance curves for the 4810

Specifications 4810



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