



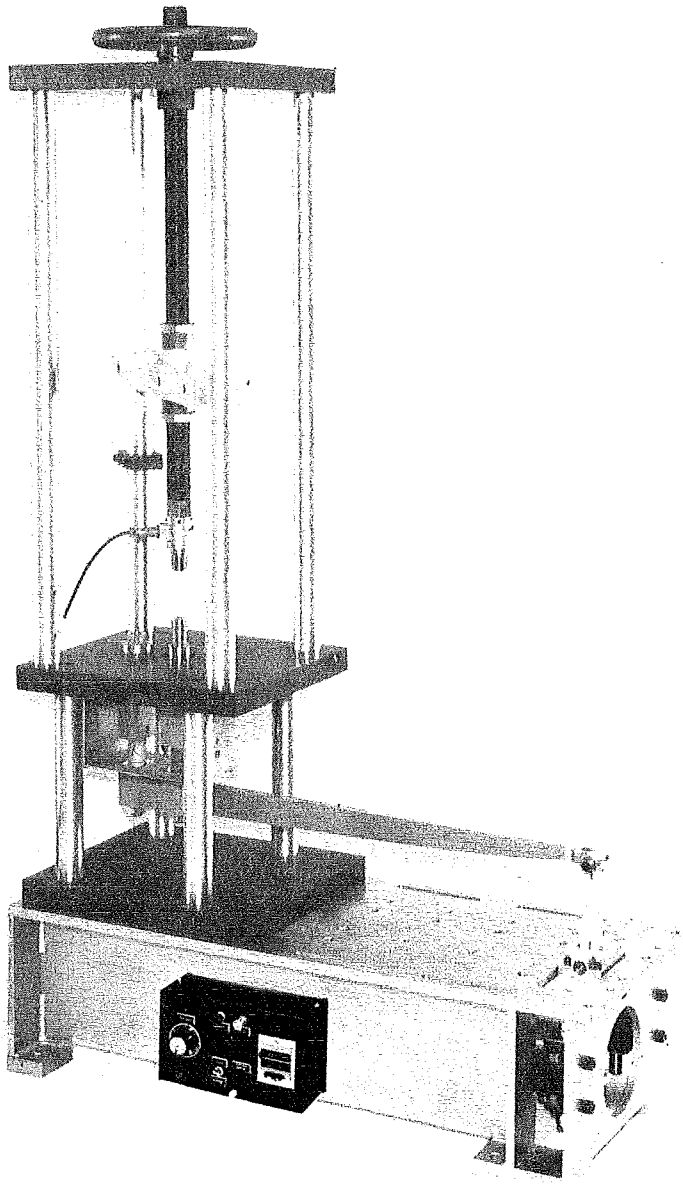
P.O. BOX 2533 • DEARBORN, MICHIGAN 48123

MODEL DS-6000 DIRECT STRESS FATIGUE MACHINE

DESCRIPTION

The DS-6000 test machine provides tension or compression cyclic loading to the test specimen mounted in an appropriate set of grips (optional) installed on the load cell and loading stud. The cyclic load and mean load are determined from known yield strength data. The mean load is applied with the load screw adjustment and locked in place. A trial stroke is chosen and the crank is adjusted to that value. (Manually operating the machine through one full cycle allows the loads to be verified.) Once the required loads are locked in, the machine is brought up to the desired speed and the counter is reset. Completion of the test is determined by specimen fracture which actuates the cutoff switch or the test may be stopped by means of the predetermined counter. Recording the digital readout of test cycles applied at the selected load completes the procedure.

By removing the tension/compression attachment and installing other available test fixtures additional types of fatigue tests may be performed.

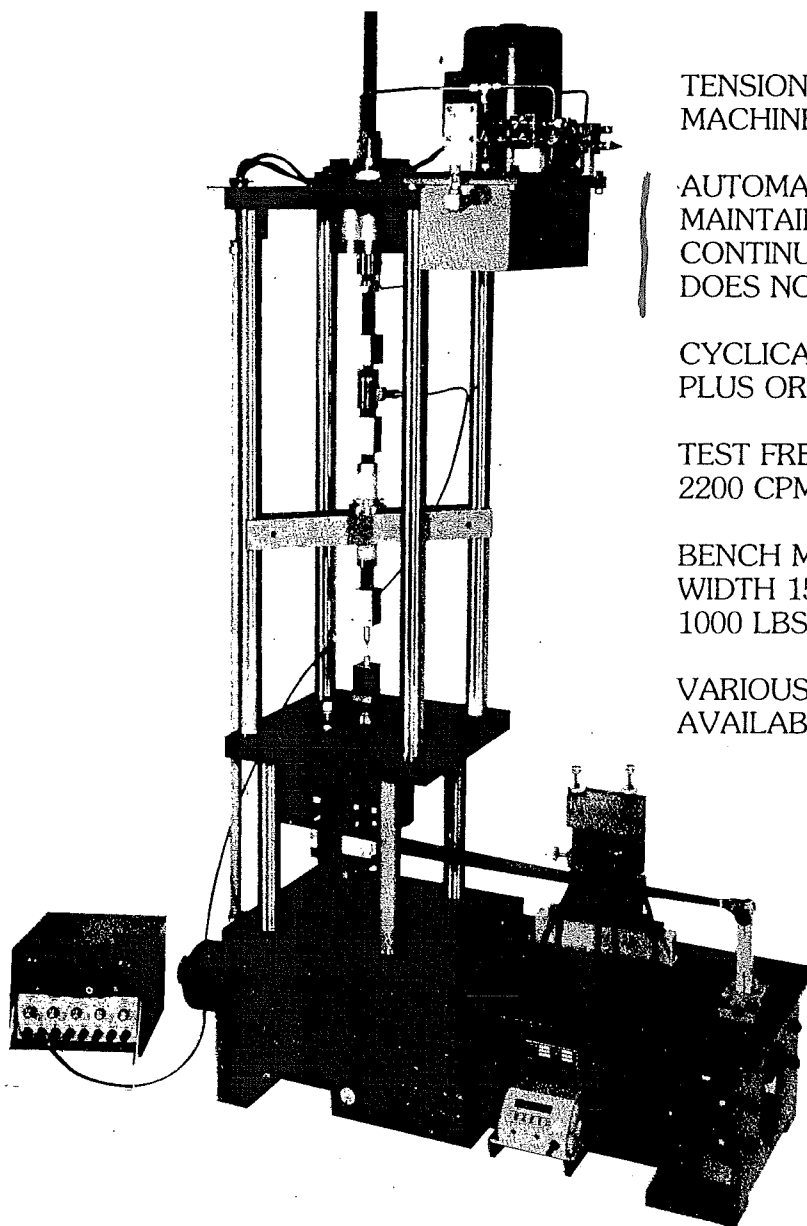


SPECIFICATIONS

Load Capacity	- up to 6000 lbs tension or compression
Speed Range	- adjustable from 200 to 2000 cycles/minute
Stroke	- variable up to 0.12"
Cycle Counter	- predetermined 99,999,900 cycles maximum count
Cutoff Switch	- interrupts machine power when specimen breaks
Load Measurement	- fatigue rated load cell with digital indicator or - optional Shutdown Controller
Power	- 115 VAC, 10 amps
Shipping Weight	- 1150 lbs

fatigue dynamics system

MODEL DS-6000 HLM DIRECT STRESS FATIGUE MACHINE



TENSION-COMPRESSION FATIGUE
MACHINE OF 6000 LB CAPACITY

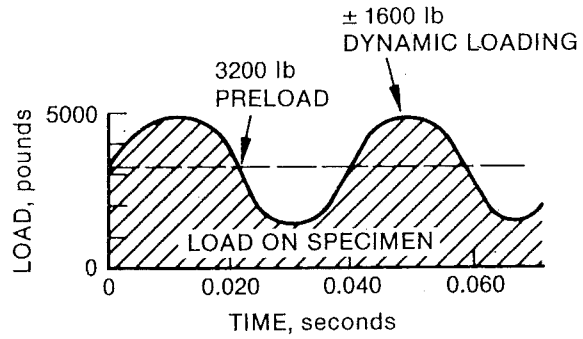
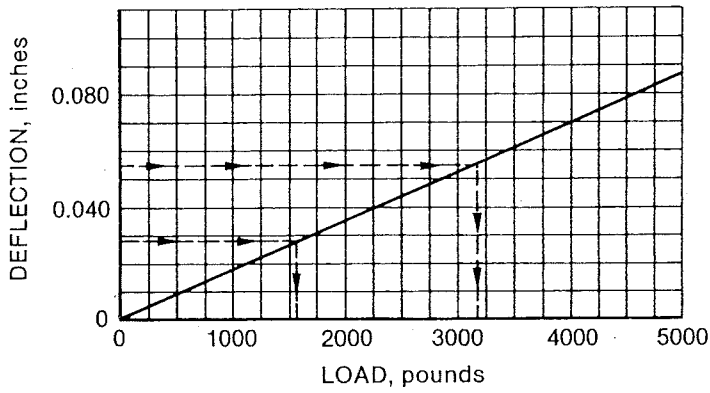
AUTOMATIC HYDRAULIC LOAD
MAINTAINER ADJUSTS PRE-LOAD
CONTINUOUSLY TO PRE-SET VALUE.
DOES NOT AFFECT THE CYCLICAL LOAD

CYCLICAL LOAD MANUALLY ADJUSTED-
PLUS OR MINUS 6000 LBS.

TEST FREQUENCY FROM 600 TO
2200 CPM

BENCH MOUNTED, LENGTH 40 IN.,
WIDTH 15 IN., HEIGHT 60 IN., WEIGHT
1000 LBS.

VARIOUS MODELS AND ACCESSORIES
AVAILABLE

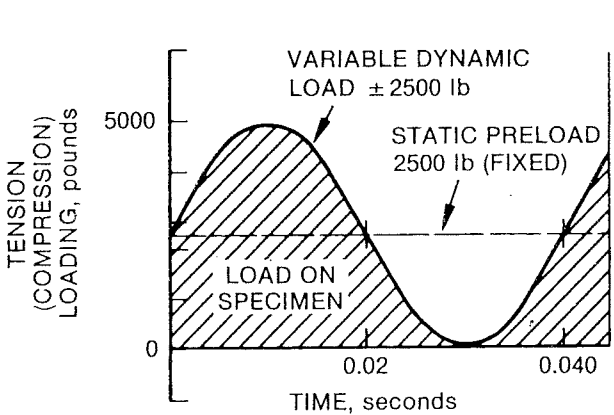


Static Load Calibration.
For dynamic load calibration, a dynamic load cell must be employed.

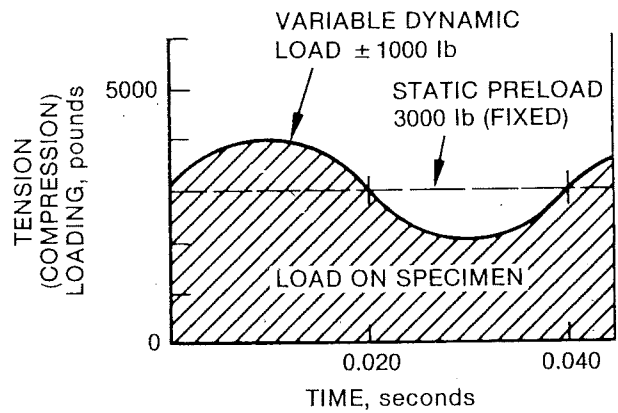
Although the static calibration procedures are quite useful as described, the use of the strain gage transducer accessories is recommended. Static load set-up procedures become very simple, and dynamic readings feasible. A transducer of appropriate fatigue rated capacity is usually installed on the upper load screw. Readout of the transducer can be done by any desired instrumentation. Some of these instruments are supplied by Fatigue Dynamics, Inc.

Typical resultant fatigue patterns, produced by these machines by superimposing the separate static and dynamic test forces, are shown by the following:

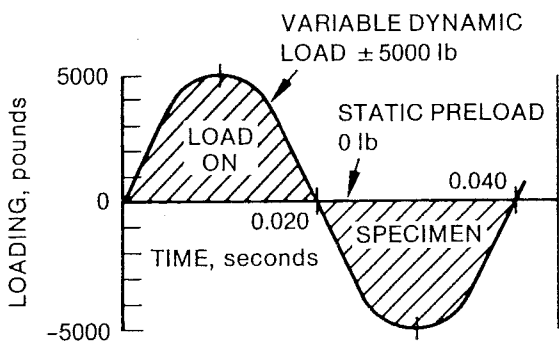
Any static preload and dynamic loading may be combined - provided the resultant load curve remains within the limits. Note that the dynamic loading alone may be set for the maximum capacity of the machine.



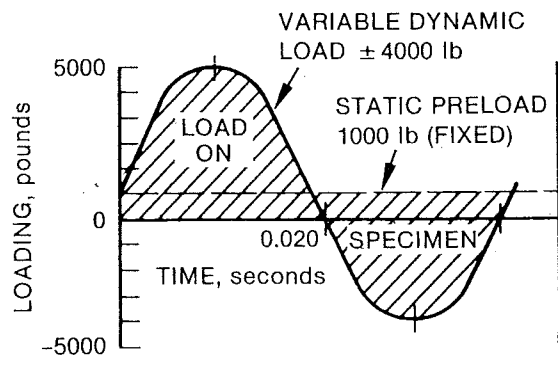
0 to Maximum Tension (Compression) Loading



Tension (Compression) to Tension (Compression) Loading



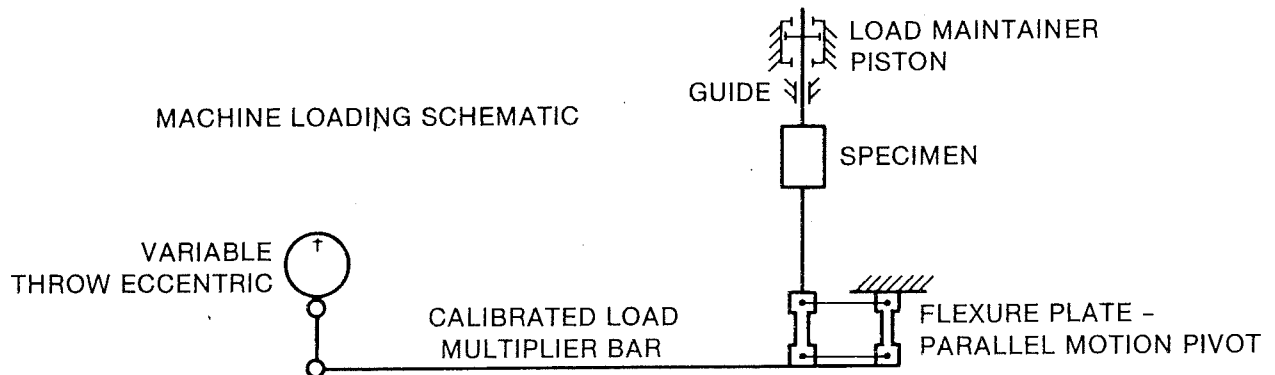
Equal Tension - Equal Compression Loading



Unbalanced Tension - Compression Loading

OPERATING PRINCIPLE

In these machines, a cyclic load is applied to one end of the test specimen through deflection-calibrated lever which is driven by a variable-throw crank. The load is transmitted to the specimen through a flexure system which provides straight-line motion to the specimen. The other end of the specimen is connected to a hydraulic piston which is part of an electro-hydraulically controlled load-maintaining system that senses specimen yielding. This system automatically and steplessly restores the preset load through the hydraulic piston. Thus, the static and dynamic loads are applied to opposite ends of the specimen, making it possible to maintain a constant load on the specimen regardless of dimensional changes caused by specimen fatigue.



TEST PROCEDURE

A separate dial bar with an indicator is used to set up the machine for the desired fatiguing load to be applied to the specimen. The dial bar is used to measure the deflection of the load lever, the amount of deflection being proportional to the testhead load.

The load lever is calibrated at the factory, and a set of data showing the calibrated deflection (in) vs. load (lbs) is supplied with the machine. The data can be used to prepare a chart like the one shown on the next page. By using such a chart, the correct load values can be set into the machine as follows:

EXAMPLE: A typical bolt carries a fixed tensile load of 3,200 pounds and a vibration induced fatiguing tensile load of $\pm 1,600$ pounds.

REQUIRED: To duplicate this actual loading in the 6,000 pound Direct Stress Machine.

PROCEDURE: The preload deflection is first found from the chart for:

Load	3,200 pounds
Deflection	0.055 inch

With the specimen in place, have the dial bar resting on the load lever with the crank located at top dead center position and variable eccentric at "0", then move the load maintainer piston upward until the dial bar indicators read above deflection.

Next, the deflection for the dynamic loading is obtained from the chart for:

Load	1,600 pounds
Deflection	0.027 inch

With the variable eccentric on center (zero throw), the throw is gradually changed by rotating the eccentric through a manually wrenched pinion drive until the additional 0.027 inch deflection is registered on the dial bar. The machine is now ready for operation. Graphically, the maintained load pattern would be as shown on page 3.