



This is the ASTM D6416 Hydromat Fixture for 12-inch square test panels in the 22-kip MTS servo-hydraulic test machine at GOUGEON BROTHERS, INC., Bay City, MI.

The pressure bladder is made of industrial belting and holds about 1 gallon of water.



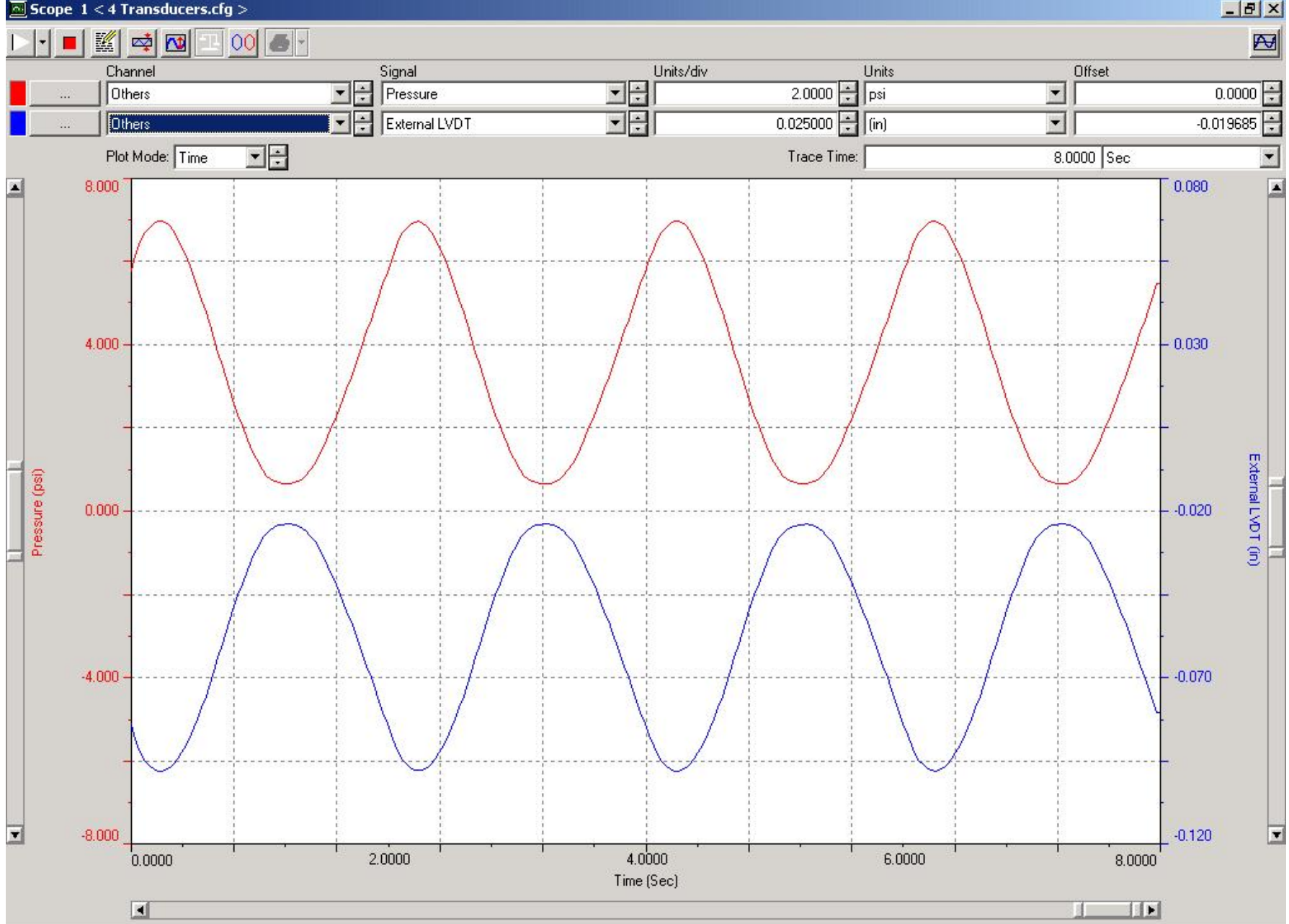
Front view of the 12-inch Hydromat test fixture. The fixture supports the test panel at the edges. Actuator rises from the base to compress the Hydromat pressure bladder against the test panel.

An LVDT measures the deflection of the test panel right at its center.



The research to support the Swift Solo design includes fatigue testing, i.e, applying repeated pressure loads. Four panels of diverse composition were chosen to undergo fatigue cycling.

Each fatigue block is 10,000 cycles long, with each full cycle lasting 2 seconds. A test lasts 5.6 hours. So far, each panel has undergone blocks at peak loads of 5 psi, 7 psi, and 10 psi.

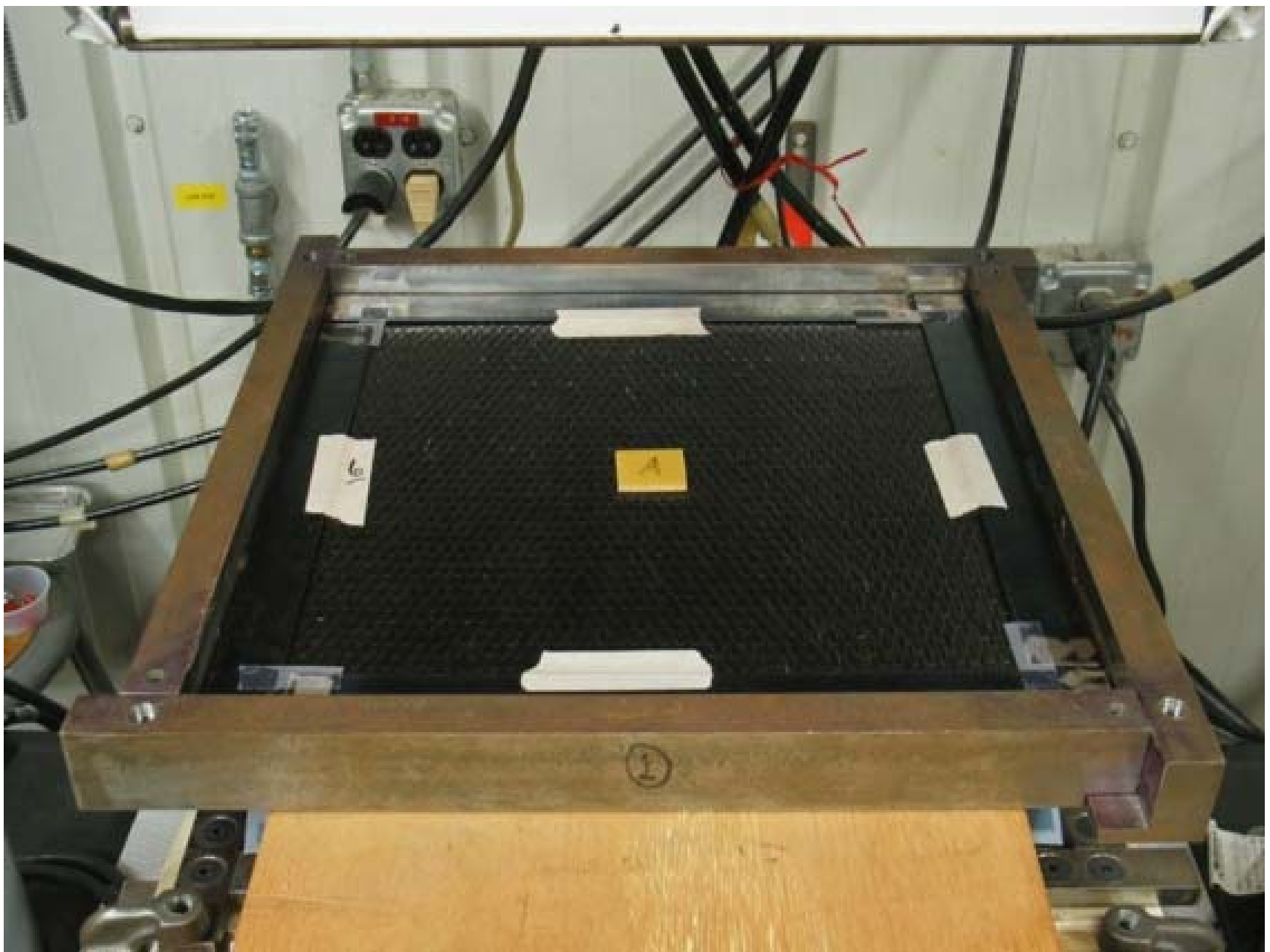


Scope shows pressure (red trace) and panel deflection (blue trace).

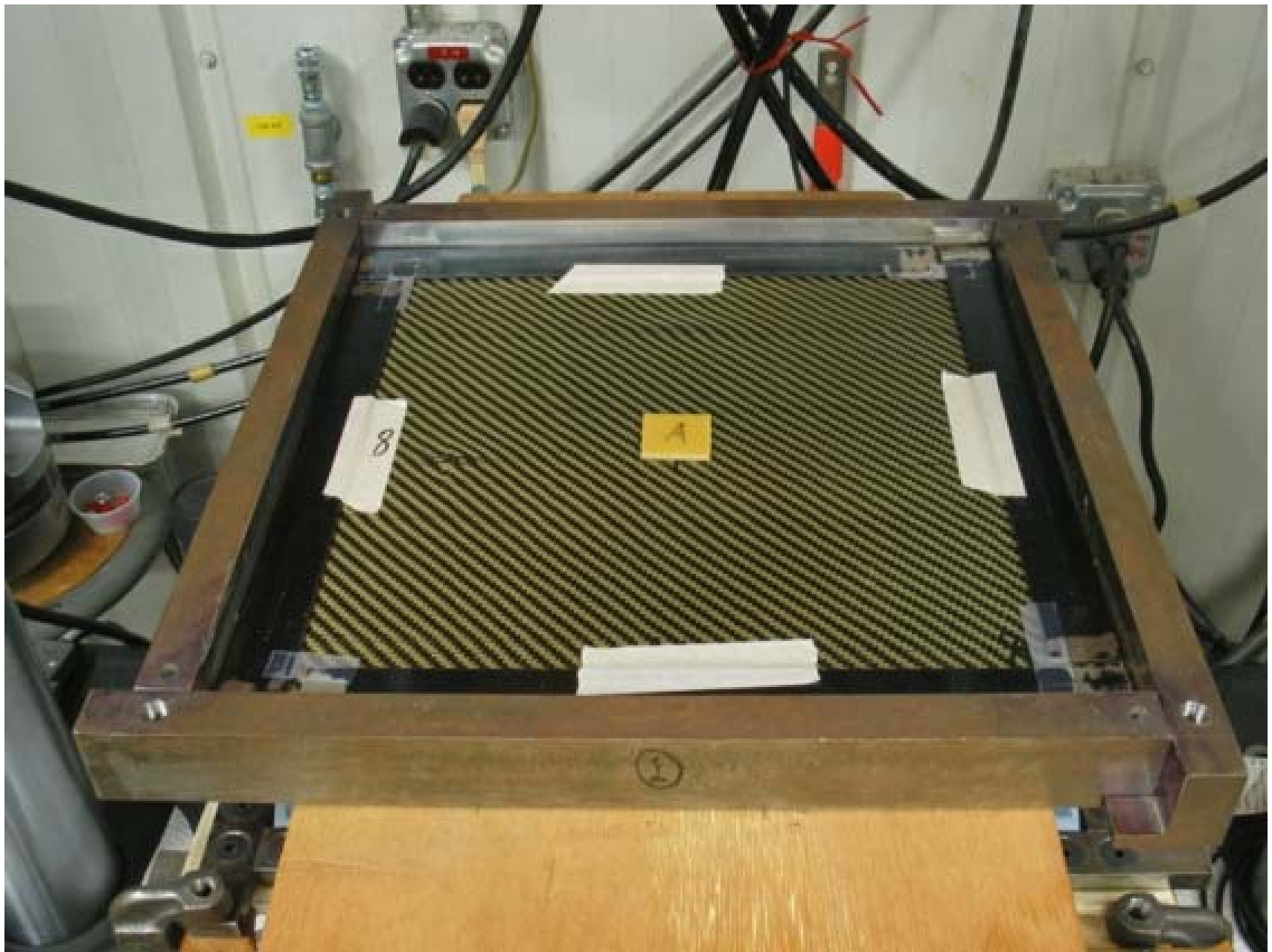




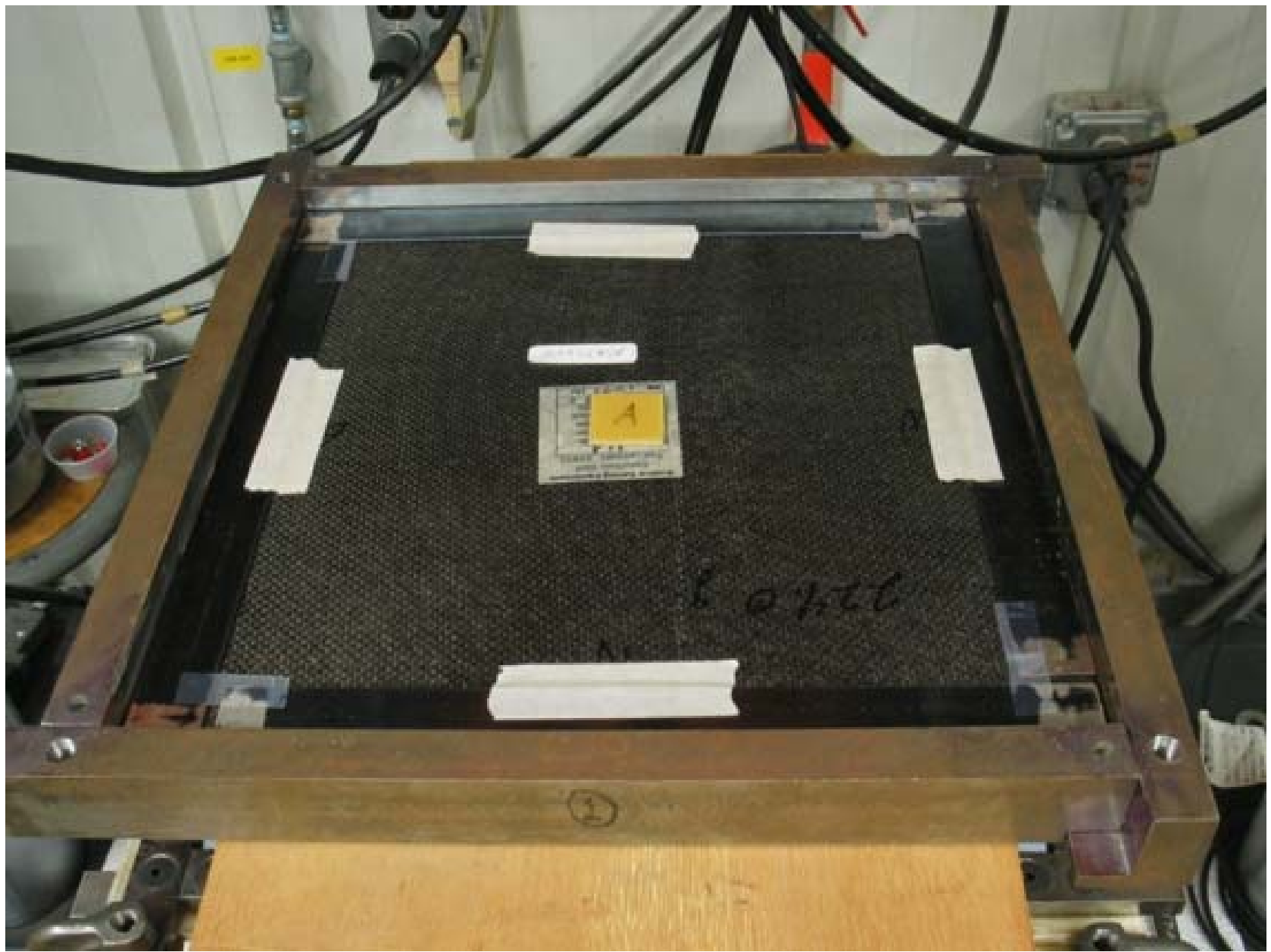
Panel #2 (49er) installed in the lower panel edge-support frame.



Panel #6 installed in the lower panel edge-support frame.



Panel #8 installed in the lower panel edge-support frame.



Panel #4A (honeycomb) installed in the lower panel edge-support frame.



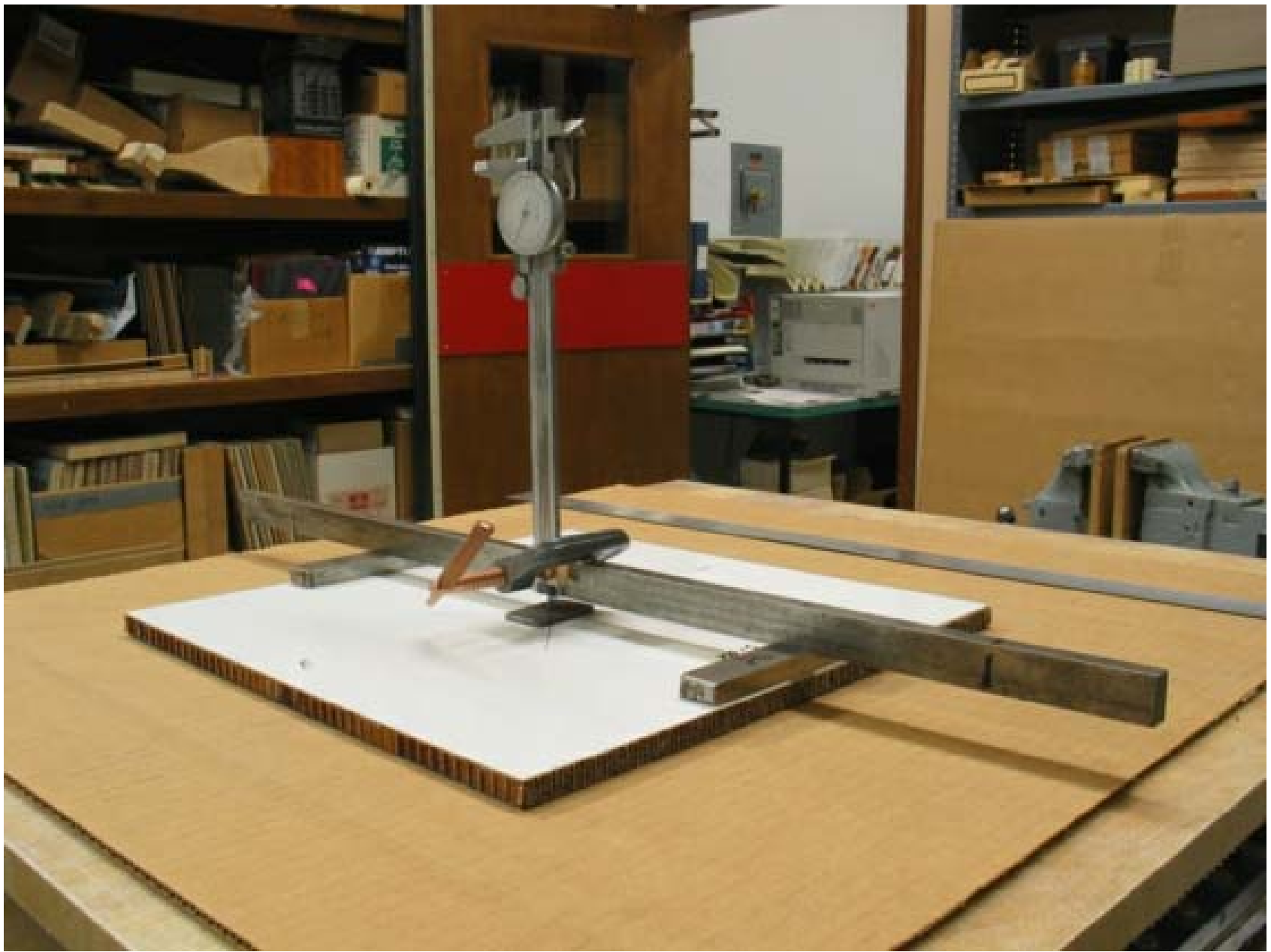


Here Panel #4A is being prepared for installation. A plywood slab supports the lower panel frame until it is bolted to the fixture. The dark strips taped to the panel edges are 1/16"-thick spring steel to diffuse the line loads induced by the main journals.

Peak pressure of 10 psi corresponds to an actual applied force of approximately 680 lbf.



0.005-inch-thick Teflon strips reduce friction on the pressure side (#6).



Post-test check of panel #4A for fatigue-induced curvature.