

# Application for Measurement & Analysis of Seat Pressure Distribution

This brief highlights the dynamic measurement capability of the Tekscan Body Pressure Measurement System.

GM, Ford, Toyota, Honda, BMW, Peugeot, Citroen, Renault, Volvo, Delphi, Johnson Controls, Bertrand Faure, and Magna are just a few of the companies extensively using the Tekscan Body Pressure Measurement System (BPMS). Unique in the market, the Tekscan BPMS delivers superior performance through innovative design and superior system engineering.

Based on Tekscan's innovative sensor technology the BPMS system provides 10 times more relevant information than its nearest competitor. Over 4,000 sensor elements allows resolution of one sensel per square centimeter, superior to any other system. This dense spatial resolution enables the user to identify and measure the effect of stitching, seams, bolsters, wire stays, foam stiffness, and the structural support frame on the pressure distribution and comfort of the seated subject. Dynamic sampling capability of 800,000 sensing cells per second (208 Hz) captures changes in pressure distribution during driving activities. Also, the system can handle simple static and quasi-static situations.

The BPMS allows designers and manufacturers to optimize material selection, conduct analysis during occupant ingress and egress, optimize ergonomic position of the driver, and record changes in driver's position during active drive testing. The effect of suspension dampening on the driver is clarified. Vibration studies can be conducted at high and low velocities. The BPMS also provides highly accurate dimensional information regarding the physical location of the ischial, saquilis and other anatomic regions.

The BPMS system is a simple to set-up and non-intrusive measurement system. The sensor is thin, 0.011 inch (0.28mm), so thin that it does not interfere with the occupant's "feel" of the seat. Sensors are placed on the seat pan and seat back and two electronic "handles" are connected to begin measurement.

The screen capture below depicts the inter-relationship of seat back and pan pressure during activation of the brake pedal during a drive test. The driver's seat back and pan were instrumented similarly to (Fig. 1). (Fig. 2) shows the pressure distribution of the driver as he prepares to apply the brakes. The uneven pressure on his bottom is a result of lifting his foot. (Fig. 3) shows the change in body pressure distribution while applying the brakes. Note the high pressure region shifted from the buttocks to the lumbar. (Fig. 4) shows a plot of the total force on the seat during this test. (Fig. 5) shows the pressure changes on the right lumbar region and under the right ischial region during the same test.

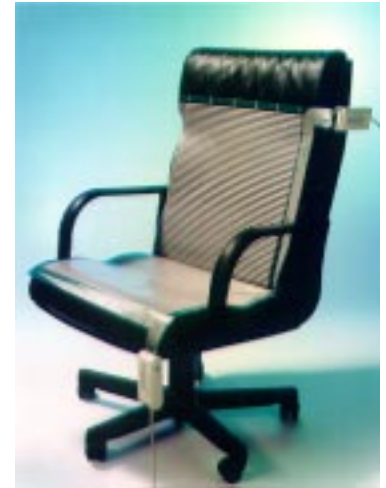


Fig. 1 Two Seat Sensors placed on a Chair

Figure 2

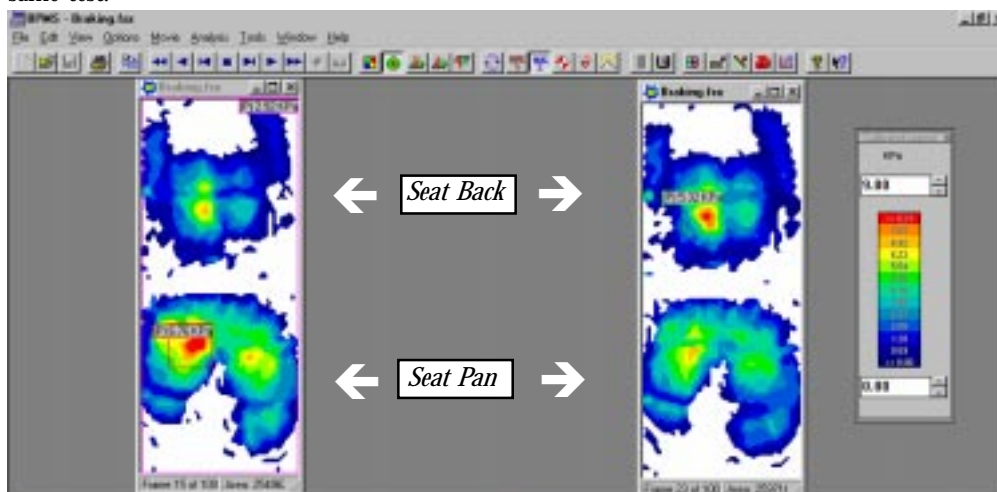


Figure 3

Figure 4

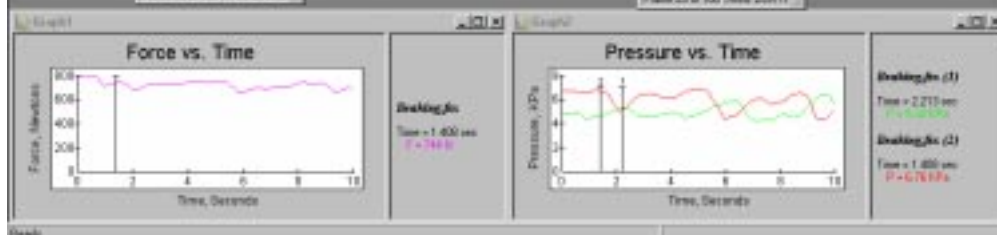


Figure 5