

THE CONCEPT II ROWING ERGOMETER ACCURATE AND RELIABLE?

McBride M.E

ABSTRACT

Australian Institute of Sport, Canberra, Australia.

The Concept II rowing ergometer is currently accepted by the international rowing community as an essential tool in the physiological assessment of rowing performance. The results of these tests are frequently used to select elite rowers and to assess the effectiveness of training programmes. In the absence of manufacturer details regarding the methods used to calibrate the ergometer and calculate variables, physiologists are forced to accept the accuracy and reliability of the ergometer digital display in their attempts to standardise workloads and compare performances.

In response to speculation regarding the accuracy and reliability of the Concept II ergometer digital display, six heavyweight male rowers performed a standardised incremental progressive test on an instrumented ergometer. Variables of pulling force and stroke length were measured at 50 Hz and used in conjunction with computer software to provide precise measurements of average stroke rate, stroke length, peak force, work/stroke and total mechanical work.

Calculations of total mechanical work correlated well with distance covered on the Concept II display ($r=0.98$), but the relationship deviated from linearity at the lowest and highest workloads. Data collected from one individual performing the test on two separate occasions revealed possible inconsistencies in the Concept II digital display. During the second test, this athlete actually rowed longer, pulled harder and performed more total mechanical work at each workload, while consistently producing lower ergometer scores.