7 year anniversary!

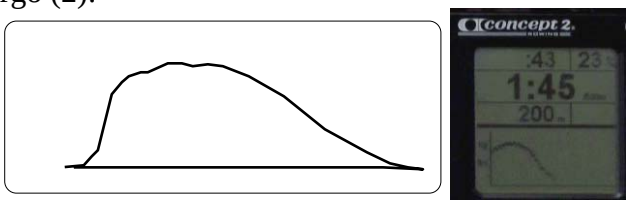
Our Rowing Biomechanics Newsletter is celebrating its 7 year anniversary! Thanks to everybody who contributed to the success of the Newsletter. We received more than 2000 replies, which was really valuable feedback for us and for development of Rowing Biomechanics.

Now the Newsletter is to be converted into mini e-journal. We invite everybody who has interesting ideas, facts and observations to contribute to our Rowing Biomechanics journal.

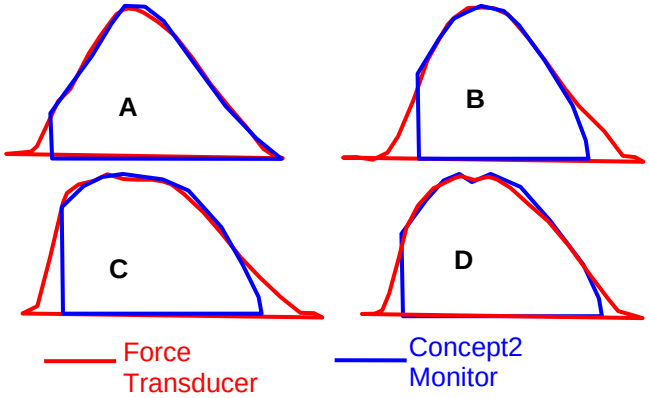
Q&A

Q: A number of coaches asked similar questions about the force curve, which can be displayed on the monitor of Concept2 ergo. The sense of the questions was: how accurately can the monitor represent the real force application?

A: We measured the handle force and position directly using transducers of WEBA Rower Ergo system (1). The force/position curve was displayed on PC screen and filmed together with the force curve on the Concept2 PM3 monitor of a model D ergo (2):



Then a few curves of various shapes were digitised, scaled and overlapped:



You can see that the monitor sufficiently represents the basic shape of the force curve and position of its peak: you can clearly see that the curve **A** is triangular with a later peak and the curve **C** is more rectangular with an earlier peak in both measurements. The monitor also was able to show humps and dents in the force curve **D**.

The obvious difference can be seen at the catch: the monitor cuts off the first 15-20cm of the force curve. Probably, this can be explained by backlash in the one-way clutch (3-8cm) and latency in the electronics, which in fact measure the acceleration of the flywheel. Curves with slower gradient of the force (e.g. **A**) allow better representation on the monitor. Steeper curves usually have cut-offs at both catch and finish (e.g. **B**, **C** and **D**) and the reason for the shape of the last one is not yet understood.

Conclusion: You can use the Concept2 ergo monitor for a rough evaluation of the force curve, which is useful with beginners and medium level rowers. More accurate feedback for elite rowers requires instrumented measurements.

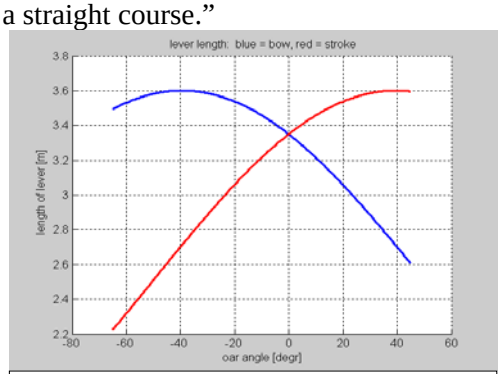
References

1. *WEBA Rower Ergo system* http://www.weba-sport.com/weba/rower_ergo.html
2. *Concept 2 PM3 Performance Monitor* http://www.concept2.com/us/products/monitors/pm3.asp

Comments

Marinus van Holst (m.holst@hccnet.nl), rowing biomechanist from Nederland sent us his comments about forces in a sweep pair published in RBN 2008/01:

"When I read this newsletter I did not immediately believe the results although I recognized the formulation of the problem. It seemed to me that to reduce the differences in stroke- and bow torques, the bow rower should reach more far at the catch than the stroke rower, but to my surprise the contrary was the case. I repeated the calculation of Valery with a model that in principle was not different from his model. The results are presented in a slightly different way. The Figure below shows that for the bow, the lever has a clear maximum at 40°. For oar angles <40° the lever of the bow force decreases. Most important and decisive, of course, is the experiment with the pairs. Without these results I would have remained skeptical that rowers in a pair would be able to achieve such fine-tuning required for a straight course."



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