



## News

☺ Dear rowing coaches and rowers!

This is the last Newsletter of the year 2001. I wish you a Merry Christmas and may all your dreams for the New Year 2002 become true!



## Facts. Did You Know That...

✓ ...the number of samples in the rowing biomechanics database in each rowers' category are the following:

Men Scull	M.Light Scull	Men Sweep	M.Light Sweep	Women Scull	W.Light Scull	Women Sweep
519	161	1628	808	489	739	1707

Here is an analysis of force parameters based on the database.

✓ ...**Maximal force** applied to the oar handle can be evaluated using the table

Force Max.(N)	Very Low (Less than)	Low (Less than)	Average	High (More than)	Very High (More than)
Men Scull	593	680	766	853	940
M.Light Scull	579	636	692	749	805
Men Sweep	491	581	671	761	850
M.Light Sweep	467	528	590	652	714
Women Scull	394	471	547	624	701
W.Light Scull	355	416	477	538	599
Women Sweep	345	412	479	547	614

If you are not familiar with the Newton unit of force, then just put a dot in front of the last digit and you'll have the force in kilograms, eg.: 593 N ~ 59.3 kgF.

✓ ...**Average force** applied to the oar handle during the drive phase can be evaluated using the table:

Force Aver.(N)	Very Low	Low	Average	High	Very High
Men Scull	308	356	405	454	502
M.Light Scull	284	322	360	398	435
Men Sweep	242	286	331	376	421
M.Light Sweep	224	259	294	329	364
Women Scull	194	240	286	332	378
W.Light Scull	189	221	253	285	317
Women Sweep	169	203	238	273	307

✓ ...**Ratio of the average to maximal forces** can be evaluated using the table:

Aver / Max (%)	Very Low	Low	Average	High	Very High
Men Scull	43.9%	48.5%	53.1%	57.6%	62.2%
M.Light Scull	44.3%	48.2%	52.0%	55.8%	59.7%
Men Sweep	40.7%	45.2%	49.6%	54.1%	58.6%
M.Light Sweep	40.2%	45.0%	49.9%	54.7%	59.6%
Women Scull	44.4%	48.4%	52.5%	56.5%	60.5%

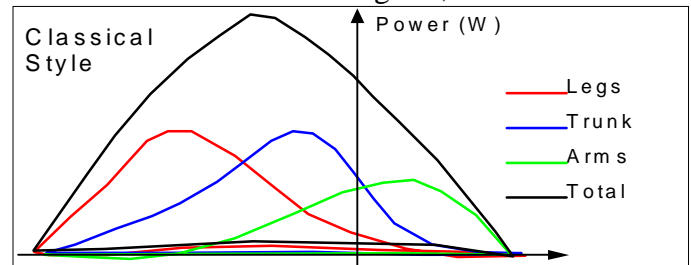
W.Light Scull	46.1%	49.7%	53.2%	56.7%	60.2%
Women Sweep	39.7%	44.8%	49.9%	55.0%	60.1%

Ratio of the average to maximal forces is an important parameter for evaluation of the force curve shape. If this parameter increases then the force curve becomes more rectangular. As we know from geometry, any rectangle has 100% of height-area ratio, and any triangle has 50%.

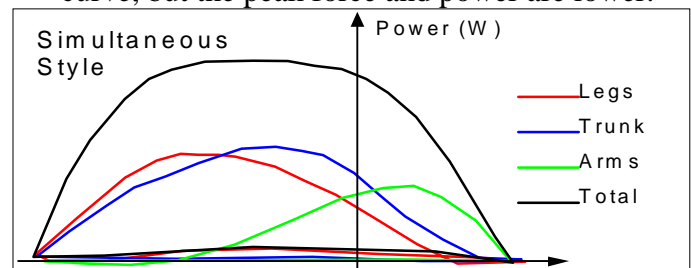
## Ideas. What if...

? ...you want to change a shape of your force curve? Then you need to know how segment sequence effects force application. The main rule is the following:

- A sequenced work of the legs and trunk (we also call it classical rowing style) produce higher maximal force and power, but the shape of the force curve is more triangular;



- Simultaneous work of the legs and trunk produce more rectangular shape of the force curve, but the peak force and power are lower.



80-85% of rowers use classical or similar rowing style and 15-20% are closer to simultaneous style.

## References

1. Kleshnev V., 2000, Power in Rowing. XVIII Symposium of ISBS, Proceedings, Hong-Kong, p. 96-99.

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