News

Many thanks to Olivier Schwebel for French translation of the Newsletter, which can be found on our web site.

Q&A

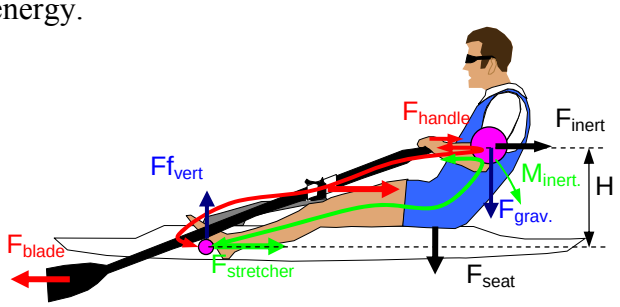
? We received a number of positive replays on the speed/rate spreadsheets published in previous Newsletter. Wayne Maher, Support Services Manager of Rowing New Zealand has asked us to include the stream speed, wind speed and direction in the model.

✓ A: We have developed a new sheet based on the wind effect data of Klaus Filter (2000) and provided it in the attachment and on our web site.

? **Q:** Rowers and coaches ask questions like this: "What is the best way to execute the finish: by means of pulling the handle or pulling the stretcher?"

✓ **A:** During the final stage of the drive the rower's body must be quickly decelerated and then accelerated towards the stern of the boat. In other words, the kinetic energy of the rower's mass, accumulated during the drive, must be transferred to the boat mass. It can be done in two ways: 1) Finish by means of pulling the Stretcher (FS); 2) Finish by means of pulling the Handle (FH).

Some coaches still believe that the first method is more efficient, because it require less effort, when the force is transferred through straight legs. They argue that in the second case the inertia force goes through bent arms that require some muscle energy.



We can put forward the following arguments in favour of the Finish by pulling the Handle:

1. FH creates additional force on the blade, which is the only external force moving forward the whole rower-boat system. FS works as a simple transfer of kinetic energy from rower to the boat and does not create any blade force.
2. FH does not push the boat down. At the finish, the legs are practically stationary relative to the boat. The upper body rotates around the hips, so its higher parts have a greater velocity. The radius of inertia (imaginary point where resultant inertia force is applied) is located somewhere about 2/3 of trunk height, i.e. the centre of a moving rower's mass is very close to the level of the handle. Therefore, FH acts linearly and does not create any moment. In comparison, the stretcher force acts at a significant distance H from the centre of trunk inertia. This creates a moment of force $M_{str.} = F_{inert} \cdot H$, which add extra 30-40% of the body weight to the vertical seat force (RBN 2002/05). The extra vertical force pushes the boat down and increases its water displacement and drag resistance force. Another contributor to the seat force is the moment of the weight of the trunk. At FS this force is balanced by an upward vertical force on the stretcher and this pair of forces increases the pitching movement of the boat and wave resistance of the shell. The weight of the trunk also can be balanced by pulling the handle.
3. FH works more efficiently using oar leverage. At FS the forces applied to the rower and boat CM are equal:

$$F = m_{boat}\, a_{boat} = m_{rower}\, a_{rower}$$

At FH the force acting on the boat is

$$F = m_{boat}\, a_{boat} = m_{rower}\, a_{rower\ (Loar/Loutboard)} \cos\alpha$$

This creates 25-15% higher boat acceleration at the oar angles α in a range 30-40 deg.
4. FH allows earlier relaxation of the leg muscles and a longer recovery. The quadriceps of thigh is a two-joint muscle, which is connected to the shin and pelvis and goes across the knee and hip joints. At FS this muscle must be used in static mode to prevent the knee from bending and pulling the trunk.
5. FH has less risk of injury of the hip and stomach muscles and tendons, which can be overloaded at fast FS at high stroke rate.

Concluding, **a finish by pulling the handle is the only effective rowing technique**. The only benefit of a finish by use of the stretcher is a nicer looking "six pack" stomach muscles, but this can be achieved in a safer and efficient way in a gym.

The drill for developing the finish using the handle is very simple: just take the feet out of stretcher shoes and try to row normally. Try it at different stroke rate, but do not compromise the stretcher push. This means the rower should push the stretcher as long as possible during the drive and then perform quick counter-movements of the arms and trunk providing impulse for recovery.

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