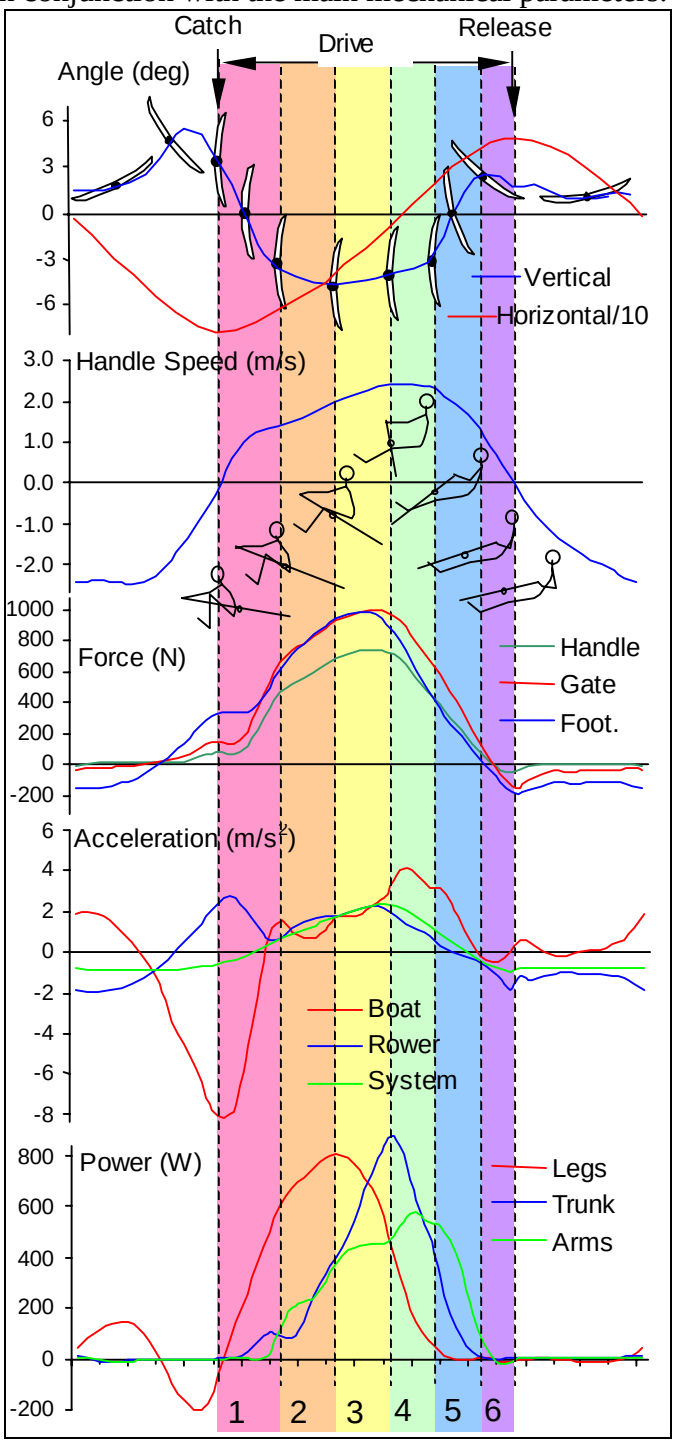
Back to basics

📖 The drive phase can be split into six sections or micro-phases. Here are their graphical definitions in conjunction with the main mechanical parameters:



Below is description of each phase and border points (*in Italic*).

***Catch**, beginning of the drive. Oar changing direction of the movement. Small inertial forces applied to the handle and the gate, but the foot-stretcher force is already significant. These forces produce a negative peak acceleration of the boat and a positive peak of the rower's acceleration.*

1. **Blade immersion.** Fast increase of handle speed and force. The boat acceleration is also increasing and becoming positive, but the rower's acceleration decreasing.

The blade is fully immersed. Little hump in the handle speed. The bend of the force curve and legs power curve. First positive peak of the boat acceleration and cavity of the rower's acceleration.

2. **Rower's acceleration.** Handle speed and forces are increasing at a slower rate. The legs are generating nearly max. power that leads to an increase in the rower's acceleration, but decrease in the boat's acceleration.

The deepest point of the blade. Second bend of the force curve. Maximal speed and power of the legs.

3. **System acceleration.** Handle speed is continuing to grow, but the forces increasing very slowly. Legs power going down and trunk power is becoming the highest. The boat and rower's accelerations are almost equal each to other and to the system's acceleration.

Maximal handle and gate force. Maximal acceleration of the system. Maximal speed and power of the trunk.

4. **Boat acceleration.** The oar is crossing the square off point. Handle speed has a plateau. All forces are decreasing, but the foot-stretcher force is decreasing faster than the gate force that produces the highest boat acceleration. The rower's and systems acceleration are decreasing as well as legs and trunk power. Peak of the arms power.

The upper edge of the blade is at the water level. Handle speed starts decreasing. Legs power is nearly zero.

5. **Blade removal.** Handle speed is decreasing. All forces are decreasing. The foot-stretcher force becomes lower than the handle force, which causes a negative acceleration of the rower and whole system.

The blade is completely out of water. Forces and accelerations are close to zero.

6. **Idle drive.** The handle is continuing to move towards the bow by inertia. Rower's mass is turning to the recovery (negative acceleration) that causes small positive boat acceleration. The system acceleration is negative due to a drag force.

***Release**, end of the drive. Oar changing direction of the movement. Inertial forces applied to the handle, gate and foot-stretcher.*

These definitions will be used for later biomechanical analysis of the rowing styles.

Contact Us:

✉ *©2002 Dr. Valery Kleshnev, AIS/Biomechanics*
POBox 176, Belconnen, ACT, 2616, Australia
tel. (+61 2) 6214 1659, (m) 0413 223 290, fax: 6214 1593
e-mail: kleshnevv@ausport.gov.au