

2.2 RECOVERY *by: Mike Purcer*

The recovery phase of the stroke begins when the athlete leaves the finish position when the body is furthest to the bow of the boat and ends when the athlete achieves the full reach position closest to the stern. During this phase, the athlete utilizes their legs to pull their feet towards their seat while pivoting the torso forward and extending their arms to maximize their reach sternward. This phase of the stroke also allows the athlete to use their centre of mass and momentum to accelerate the boat by pulling the footstops towards their seat. This section promotes the simultaneous body movements of the legs, torso and arms utilized in racing to be developed at lower practice rates.

For most of the history of our sport, the recovery movements were taught in sequential order, with the hands/arms moving first, followed by the torso swing forward, and lastly, the legs flexing the knee joint to pull the athlete up the slide. Athletes were coached to quickly move their hands and arms away from the finish position until the arms were straight. As the hands move away, the torso swings forward from the hips while the legs remain straight. Once the arms were straight and the torso passed the perpendicular, the legs moved the body up the slide at a constant controlled speed. These movements in sequential order were emphasized in practice at lower rates.

Video analysis of crews racing shows conclusively that the movements of the arms, torso and legs work simultaneously during the recovery phase. Athletes move their legs, torso and arms together from the finish position. In the final part of the recovery, the arms are straight, and the torso reaches the forward angle before the legs bring the seat to the frontstops. The recovery movements emphasize acceleration from the finish position toward the next catch. During practice, the legs, torso and arm movements start slowly to allow acceleration in the extended recovery time at low rates. The biomechanical synchronization of the muscles in racing must be taught in

practice to maximize performance. This text hopes to break down and highlight the simultaneous movements of the legs, torso and arms during the recovery.

The recovery involves the athlete moving from the finish position to the catch position while rowing. This movement can increase the boat's hull speed during the recovery as the athlete's weight or mass has inertia at the end of the drive phase of the stroke. The athlete's mass is typically four to seven times greater than the boat, and both travel at the same speed when the athlete reaches the finish position. As the athlete moves toward the catch, they pull their footstops toward their seat, and the boat accelerates. Boat acceleration is only possible while the athlete accelerates their footstops towards their centre of mass, and moving at a constant speed will not create enough force on the hull to overcome the drag factor and the boat to decelerate. Moving on the slide too quickly will increase the hull speed early in the recovery phase, causing an ineffective extended hull deceleration. During racing, the body, leaving the finish, accelerates towards the catch position for approximately 55 to 70 percent of the time of this phase. The movement of the footstops toward the body should extend the hull acceleration as long as possible in racing and in practices at all rates.

The final part of the recovery requires the athlete to decelerate in a very short time and be able to change direction at full reach. During this part of the recovery, the boat decelerates rapidly as the athlete prepares for the catch and drive phase. The final movements of the recovery include squaring and bringing the blade down to the water's surface at full reach. The recovery ends with the athlete reaching towards the stern at the full reach position.

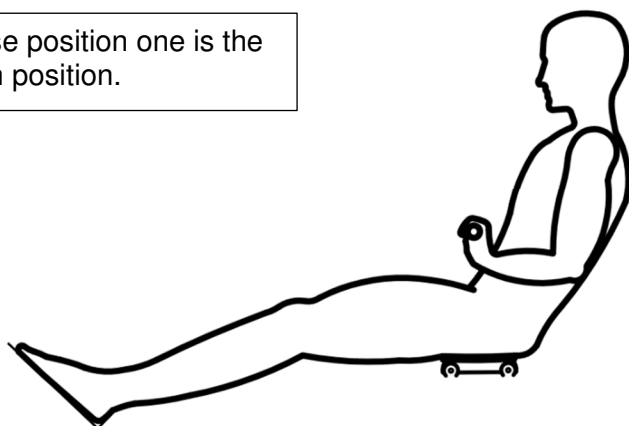
2.2.1 Recovery Movement

This section describes in point form the movements of the legs, torso, arms and oar blade and graphic representations of the recovery movements.

Figure 2.2.1a

Finish Position 1

Pause position one is the finish position.

**Legs**

- legs straight but relaxed, fully extended, and now pulling on the shoes from the top of the feet

Torso

- layback position, with the shoulders back
- core muscles contracted, ready to pivot the torso
- shoulders down and back, having just completed the release
- head up, eyesight forward and level on the horizon

Arms

- upper arms back with elbows at or behind the centerline of the torso
- lower arms level with water
- hands holding the oar handle at the body
- wrists down, holding the blades in the feather position, sweep rowing: inside wrist down outside wrist is flat

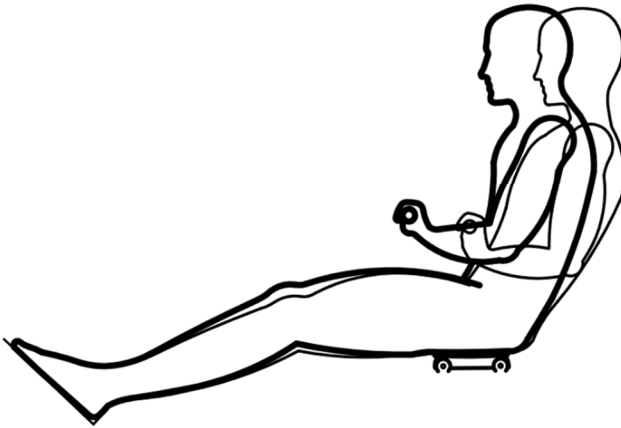
Oar

- the blade is above the water on the feather

The finish position is both the end of the drive and the beginning of the recovery phase.

Figure 2.2.1b

Recovery Position 2 (14%)



Legs

- feet are connected, pulling the top of the shoes to initiate the recovery. the movement starts slow
- hamstring muscles engage, contracting the knee joint and pulling footstops towards the seat.

Torso

- abdominal muscles engage contracting to pivot the torso forward simultaneously as the knees bend
- lower back remains straight with neutral spine position as the torso pivots forward
- shoulders moving forward with upper arms
- head remains level as eyes track the horizon

Arms

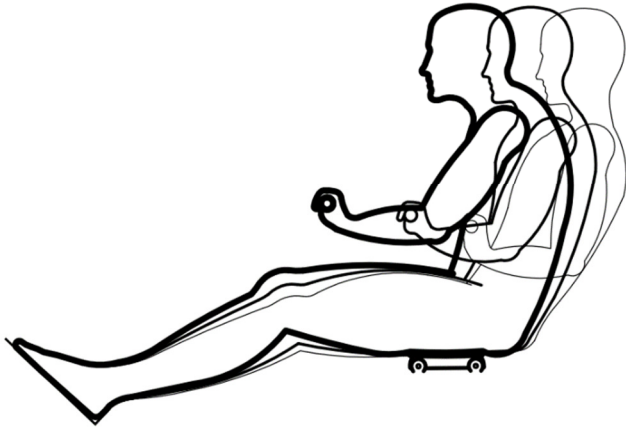
- arms move the hands toward the stern, simultaneously with torso and leg movements

Oar

- the blade is in the feather position above the water

At race rates, the movements will accelerate the boat. At lower practice rates, the movements start slow, allowing extended acceleration on the slide over the longer recovery time period.

Figure 2.2.1c

Recovery Position 3 (29%)**Legs**

- legs continue to accelerate footsteps towards the seat

Torso

- torso continues to pivot from the hips
- lower back remains straight with good posture, neutral spine is maintained
- shoulders down and shifting forward with upper arms
- head level with eyes on the horizon

Arms

- arms continue to move the oar handle away from the body
- arms and wrists as relaxed as possible
- hands holding the oar handle under fingers

Oar

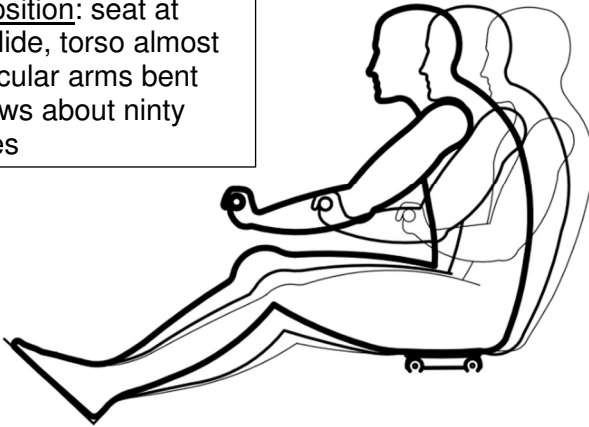
- the oar handle moving toward the stern above the legs
- blade on feather above water

The simultaneous movements of the legs, torso and arms allow acceleration of the boat to the athlete's centre of body mass.

Figure 2.2.1d

Recovery Position 4 (43%)

Pause position: seat at quarter slide, torso almost perpendicular arms bent with elbows about ninety degrees



Legs

- legs continue to accelerate footstops towards the seat, which is about one-quarter slide

Torso

- the torso continues to pivot forward and is about perpendicular as the hands are over the knees

Arms

- arms bent and continuing to straighten. elbows about ninety degrees when hands are over knees
- wrists relaxed, and oar handle is held under fingers

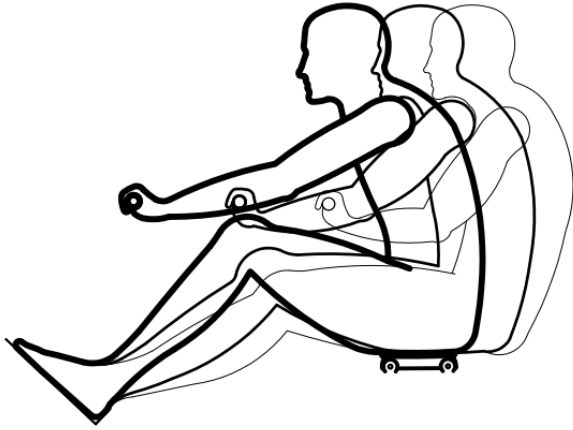
Oar

- blade on the feather
- blade begins to gain height above water

This is often used as a pause position in practice to ensure the athletes utilize the simultaneous movements (legs, torso and arms) together as they do in racing.

Figure 2.2.1e

Recovery Position 5 (57%)



Legs

- legs continue accelerating footstops toward the seat

Torso

- torso pivoting forward with the lower back straight
- shoulders shifting forward as arms extend

Arms

- arms are bent and continue to extend
- wrists start straightening, rotating around the oar handle to feather the blade.

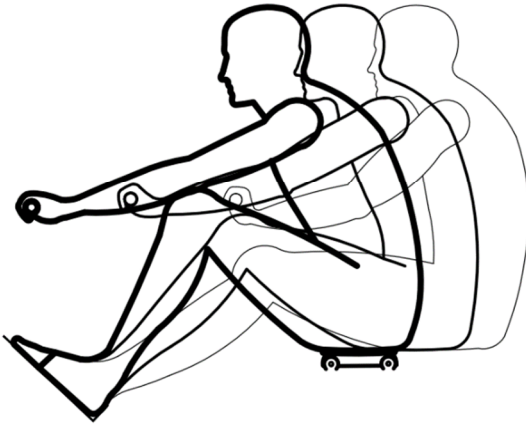
Oar

- the oar handle is dropping slightly to allow the blades to gain height over the water as they square

The simultaneous flow of the body movements continues to accelerate the footstops toward the seat.

Figure 2.2.1f

Recovery Position 6 (71%)



Legs

- heels are lifting off the footplate
- legs are pulling footstops toward the seat but at a slower speed.

Torso

- torso pivot slows as it nears the catch angle
- shoulders reaching forward, upper back may appear to curve to support reaching
- lower back is straight
- horizontal movement is maintained

Arms

- arms almost straight
- the wrists are squaring the blade
- hands are low, and the oar handle grip starts to tighten

Oar

- the blade well off the water is starting to square.

This is the start of the approach to the catch. At this point, acceleration has ended, but the legs continue to pull the footstops toward the seat. The athlete is not conscious of the slowing and begins to focus on preparation for the catch.

Figure 2.2.1g

Recovery Position 7 (86%)**Legs**

- ankles flex, and heels continue to lift off the footplate
- legs pulling footstops toward the seat slows as the athlete approaches the catch
- thighs are rising as knees contract and push against the torso, which is now at the full catch angle

Torso

- torso reaches full catch angle. The lower back is straight
- shoulders are reaching forward with upper arms
- sweep: shoulders are twisting towards the oar

Arms

- arms are straight and reaching forward
- wrists are flat, and the oar handle is being held firmly in the fingers
- hands are rising to bring the oar blade down to the water

Oar

- oar blades fully squared and dropping toward the water

The athlete is in the final stage of preparing for the catch. The arms and torso reach forward, with the torso starting to press against the thighs.

Figure 2.2.1g

Full Reach Position 8 (100%)



Legs

- legs fully compressed on the balls of the feet
- shins are perpendicular

Torso

- torso compressed on the legs (sweep: the torso is compressed on the inside leg while the outside arm is between the knees)
- lower back is straight
- shoulders are reaching forward (sweep: shoulders are level but have twisted towards the oar handle)

Arms

- oar handle is being held firmly in the fingers
- wrists are flat and arms are straight and reaching
- hands lifting oar handle to water

Oar

- the oar is at maximum reach forward (oar catch angle)
- the blade is square and touching the surface of the water

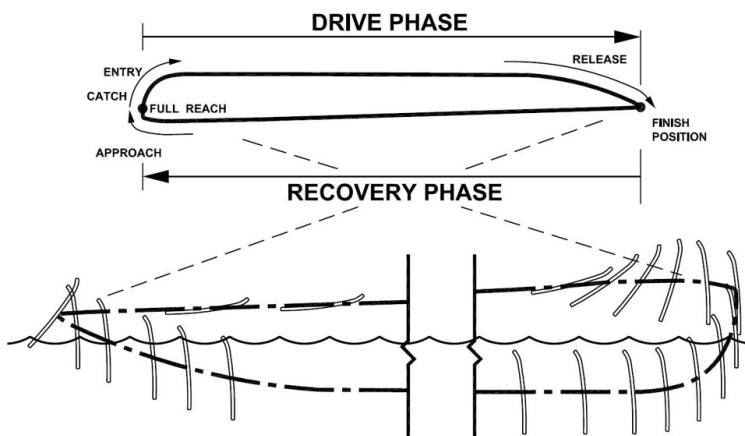
The full reach position is the end of the recovery and the beginning of the drive phase of the stroke.

The recovery movements effectively reposition the athlete's body from the finish to the full reach position while maximizing the boat's speed in the water. The recovery provides a chance for the muscles that contract as the prime movers on the drive phase to extend as the athlete returns to full reach at the catch. The final part of the recovery is preparing for the catch, which ends when the athlete reaches the full reach position.

It is important to remember that although the recovery phase may vary substantially in duration between racing and practice at low rates, the synchronization of the body movements remains the same, and it is only the duration of time and speed of the muscle contractions that changes. The muscle groups work simultaneously to move the athlete from the finish position to full reach at the catch.

The oar handle and blade movements are shown in Figure 2.2.1h. The figure details the theoretical blade and oar handle movements relative to each other, and actual movements vary between athletes and crews. Also, the blade is almost stationary in the water while the oar handle moves with the athlete and the boat.

Figure 2.2.1h *Oar Handle and Blade Movements*



Note: the blade does not move through the water but acts as the fulcrum of the oar lever

2.2.2 Recovery Speed

The body movement speed during the recovery is critical to maximizing boat speed and rowing rhythm. **Rhythm** results from effective power application while transferring athlete weight from stern to bow during the drive phase, synchronized with moving the body through the recovery with timing and speed transitions that maximize the boat's average speed through the stroke cycle. **Timing** is 1. the crew matching their body and blade movements perfectly together through the stroke cycle, and 2. matching the movements of the body with the blade to maximize efficiency, for example, blade entry at full reach when the seat is at the frontstops.

The recovery is an opportunity to maximize boat speed by utilizing the body's mass and the simultaneous movements of the legs, torso and arms. The technique described here are the actual movements that all crews exhibit in racing. This text hopes to promote using these racing movements during practice and at all stroke rates. Coaches can reference Section 2.9 Drills for information on promoting recovery skills.