

Flat Water Technique

Four Phase Stroke Framework

A paddlers technique is an important aspect for performance in all flatwater disciplines.

Flatwater racing is a highly technical discipline, in combination with physical qualities and a good equipment set up these together help make the boat move effectively

The technical execution of a paddler is about maximizing connection across the system and coordinating movement of the boat, body and blade to maximize forward propulsion.

The kayak stroke itself is a continuous, cyclic movement. This cyclical movement can be divided into four phases, this can help build the understanding around the principles in each phase and how they can be maximized to help positive boat movement. These phases are below:

Set Up



The Set Up Phase is a very important phase of the kayak stroke, it's the natural break/pause between single strokes. It's primary aim of this phase is to allow the paddler prepares for the next forward stroke.



The aims of the **Set Up** phase are for the paddler to

- Use the natural separation of the stroke
- Manage the paddle angle to maximize the catch entry
- Maintain rotation from the leg/hip/torso movement from the end of the previous stroke
- Hold the tension from the footrest to control the platform
- Set functional reach for the next stroke

Key Aspects

- Front hand approximately between shoulder and eye height
- Back hand approximately between eye and top of the head, importantly not lower than the front hand
- Shoulders are relaxed
- Paddle angle is downward to maximize the blade entry to the water
- Top arm approximately held in with close to 90 degree elbow, less than 90 degree armpit and 45 degree shoulder rotation
- Legs and Hips are wound up to aid torso rotation
- Pressure on the footrest from pressing and pulling foot

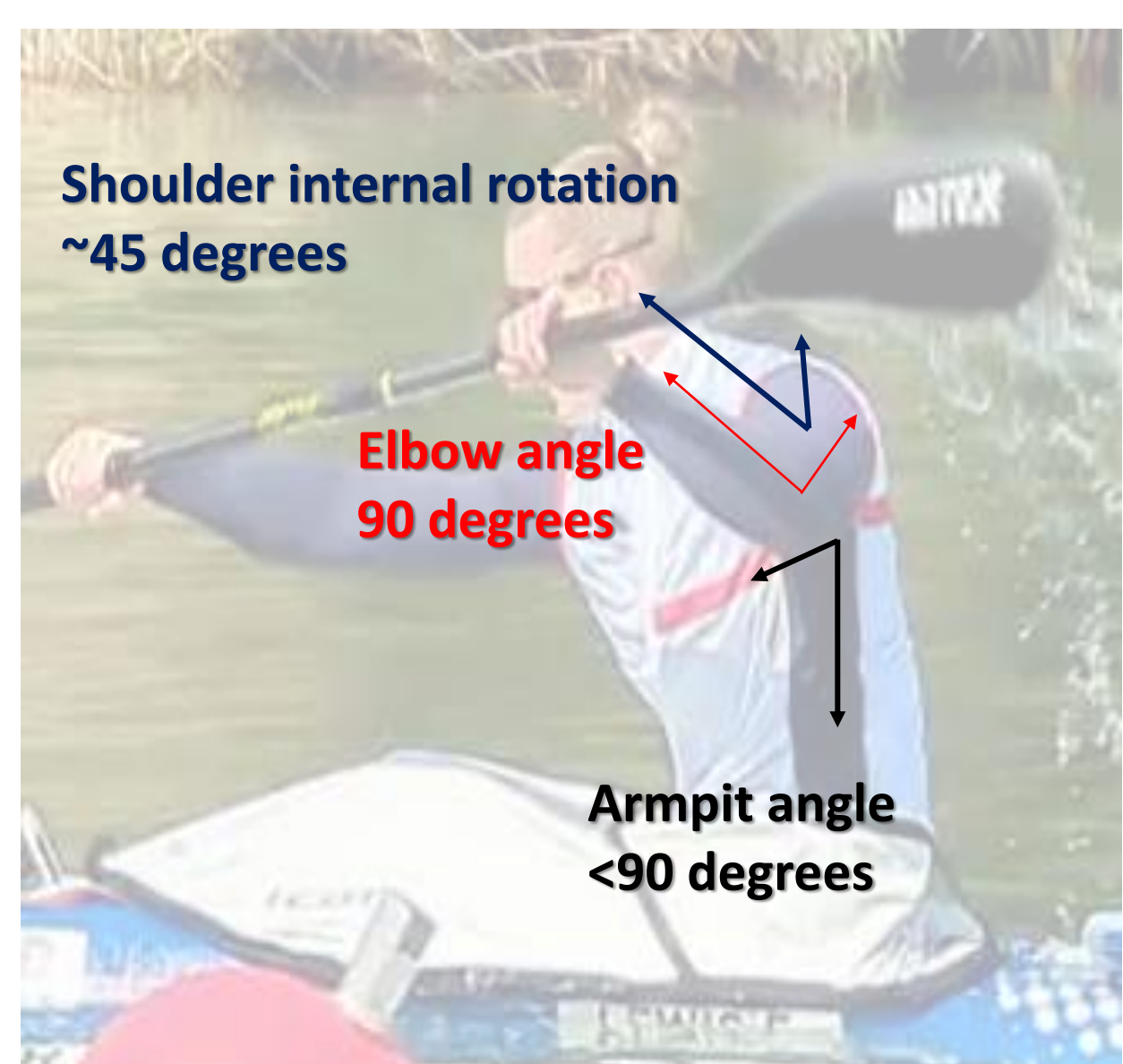


Fig 1 Lateral view of the 90/90/45 set up

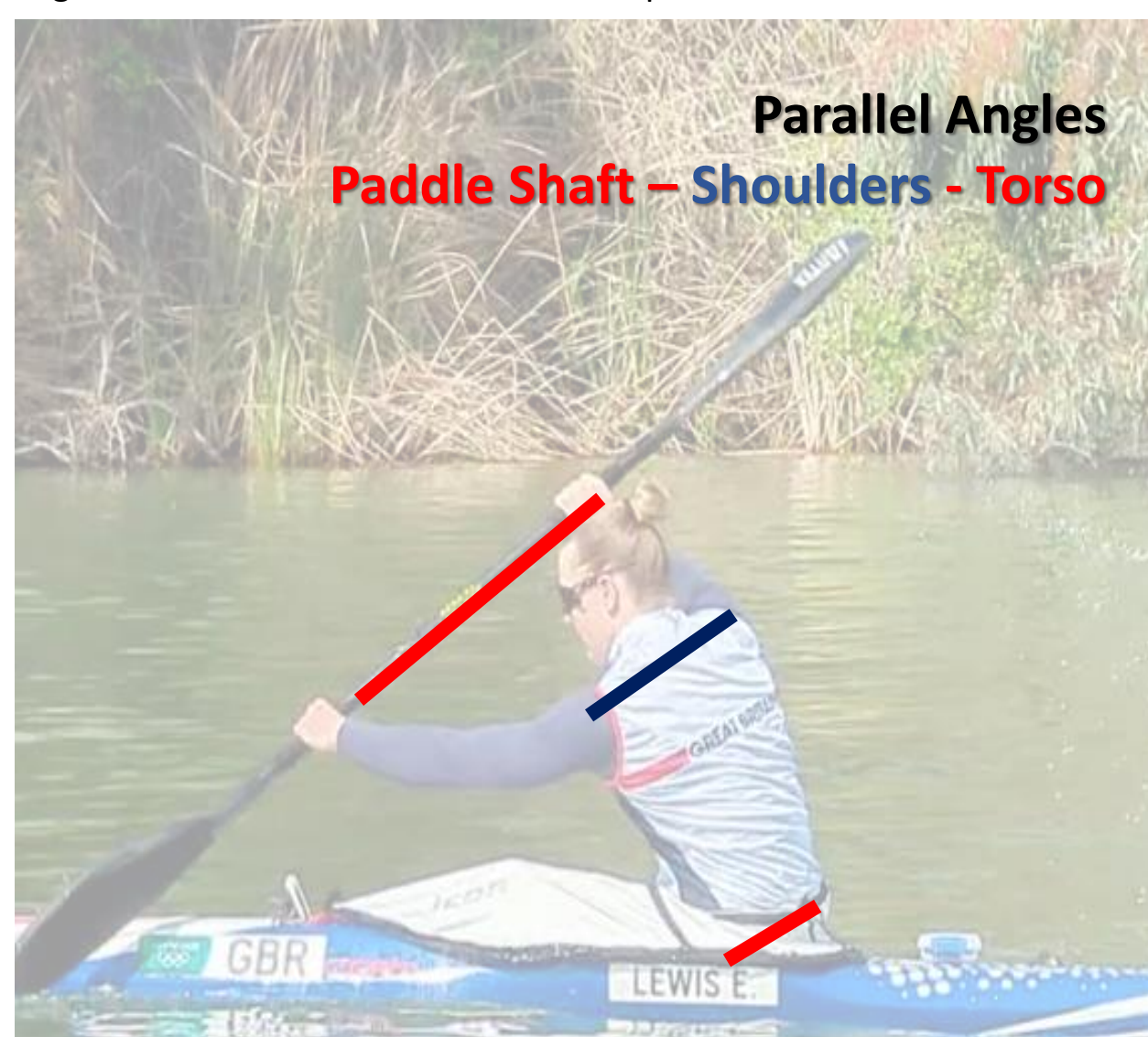


Fig 2 Roughly Parallel angle of paddle shaft / shoulder/ hips

Catch



The Catch Phase involves the paddler burying the paddle into the water to 'lock the blade' and grip the water. It is the primary aspect where the paddler begins the propulsion phase of the stroke.



The aims of the **Catch** phase are for the paddler to

- Manage the paddle entry angle of around 60 degree to maximize functional reach of the stroke
- Maintain the 'frame' created between paddle shaft, arms and shoulders
- Use the top shoulder to primarily apply downward pressure to fully submerge the blade into the water
- Minimal loss of torso position and rotation before the blade is locked
- Continue to hold the tension from the footrest to control the platform across the legs and hips

Key Aspects

- Both hands drive with downward pressure together to bury the blade into the water
- Top shoulder drives the downward movement with the top arm stays at a similar height
- Shoulders stay relaxed
- Leg drive begins from stroke side leg begins as the blade enters the water
- Torso position stays fixed
- Paddle angle is maintained by no arm movement
- The bottom arm elbow does not break
- The Top arm **does not** punch forward



Fig 3 Holding of the frame

Drive



The Drive Phase is where the paddler transfers maximal forces through the body's connective chains to generate forward propulsion of the boat. It begins when the blade is fully 'locked' and the main driving force for this phase is the use of leg drive and the paddlers rotation.



The aims of the **Drive** phase are for the paddler to

- Rotate past the locked paddle with whole body connection (not by the arms)
- Use the forces from initiated from leg drive transferred into hip and torso rotation
- Maximizing maintaining time around vertical paddle angle by holding the frame with a fixed top hand and elbow position
- Aim to increase the amplitude of the stroke through this phase, moving past the blade at greater, and greater speed
- Maintain good torso posture and minimal body movement outside of the technical patterning

Key Aspects

- Arms hold the fixed frame across the paddle shaft and shoulders is maintained
- Arms apply consistent pressure to keep the blade submerged
- The paddler uses rotation driven from the leg drive to move themselves past the locked blade
- The path of the paddle is initially down the line of the boat and approximately inline with the paddlers footrest then gradually travels outward driven by maintenance of the frame and use of torso rotation.
- Path of the blade is similar angle to the wash line created off the front of the boat

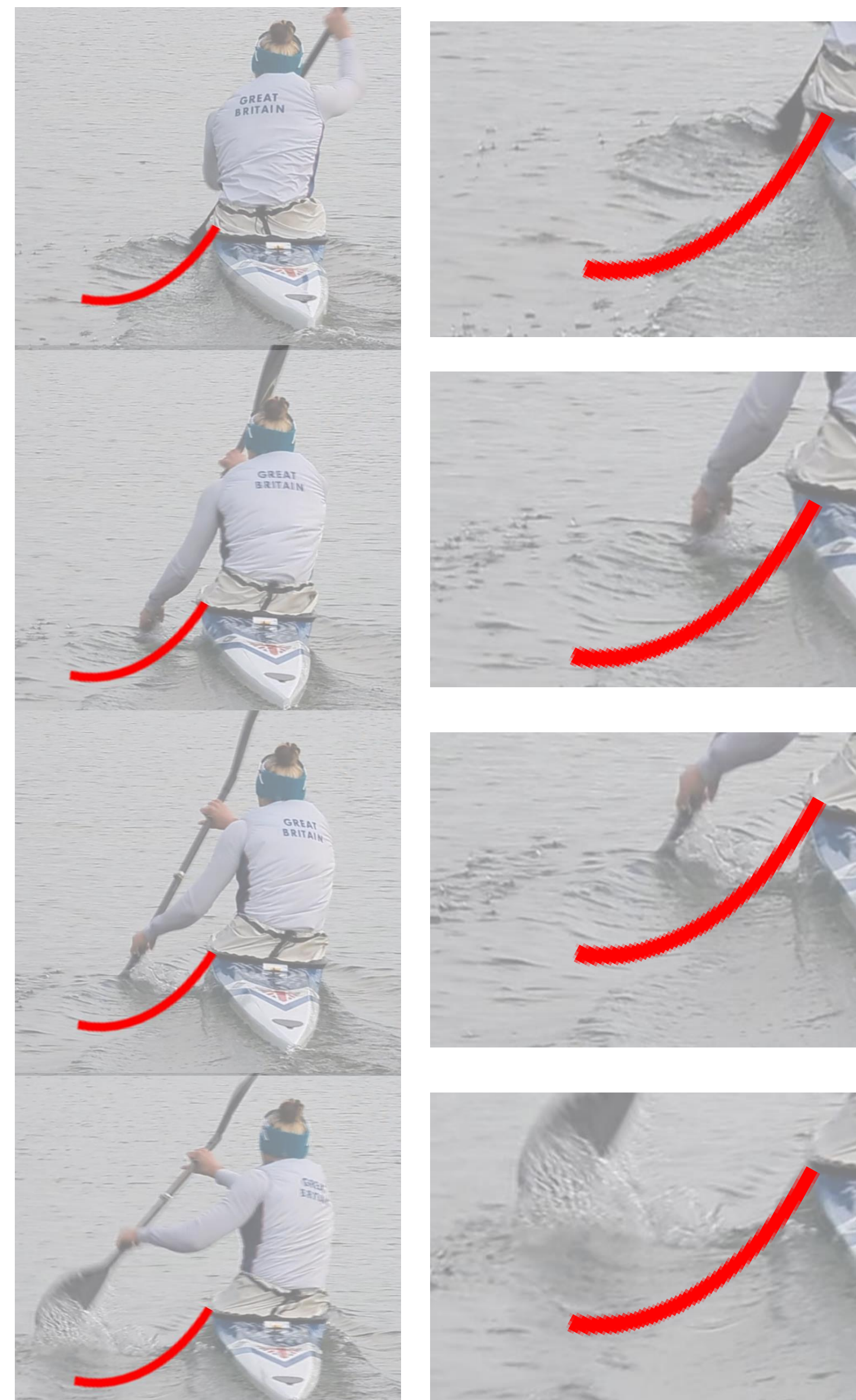


Fig 4 Path of the blade through water phase of the stroke

Exit



The Exit Phase is where the paddler removes the blade from the water. The exit is driven through a combination of the completion of the torso rotation, the leading of the top hand and the lifting of the bottom hand lead by the knuckles



The aims of the **Exit** phase are for the paddler to

- Finish the stroke with a clean exit of the blade from the water without lifting excessive water
- Blade is removed from the water before the paddlers bottom hand passes their hip
- Top hand finishes the extension forward and remains at the same level to act as a pivot
- Torso rotation is maximized forwards to help the removal of the blade from the water
- Leg drive and hip position is held to stabilise the boat as the blade exits the water

Key Aspects

- The blade exits the water before the bottom hand passes the hip
- The momentum of the drive phase is maintained into the exit
- The continuation of the torso rotation drives the top shoulder to allow the top arm to lead the exit
- The exit of the blade is led from the knuckles of the bottom hand with the elbow following this movement
- The angle of the blade is kept controlled so to minimize lifting excess water
- The legs and hips hold their position with relaxed tension to maintain the weight on the same side as the exiting blade and keep the balance in the boat/platform
- The legs and hips hold their position so the body rotation can be maximized for the next stroke
- The top hand reaches the extended position and acts as a pivot for the bottom hand to work around
- The top hand can travel over the centerline of the boat but the top blade does not

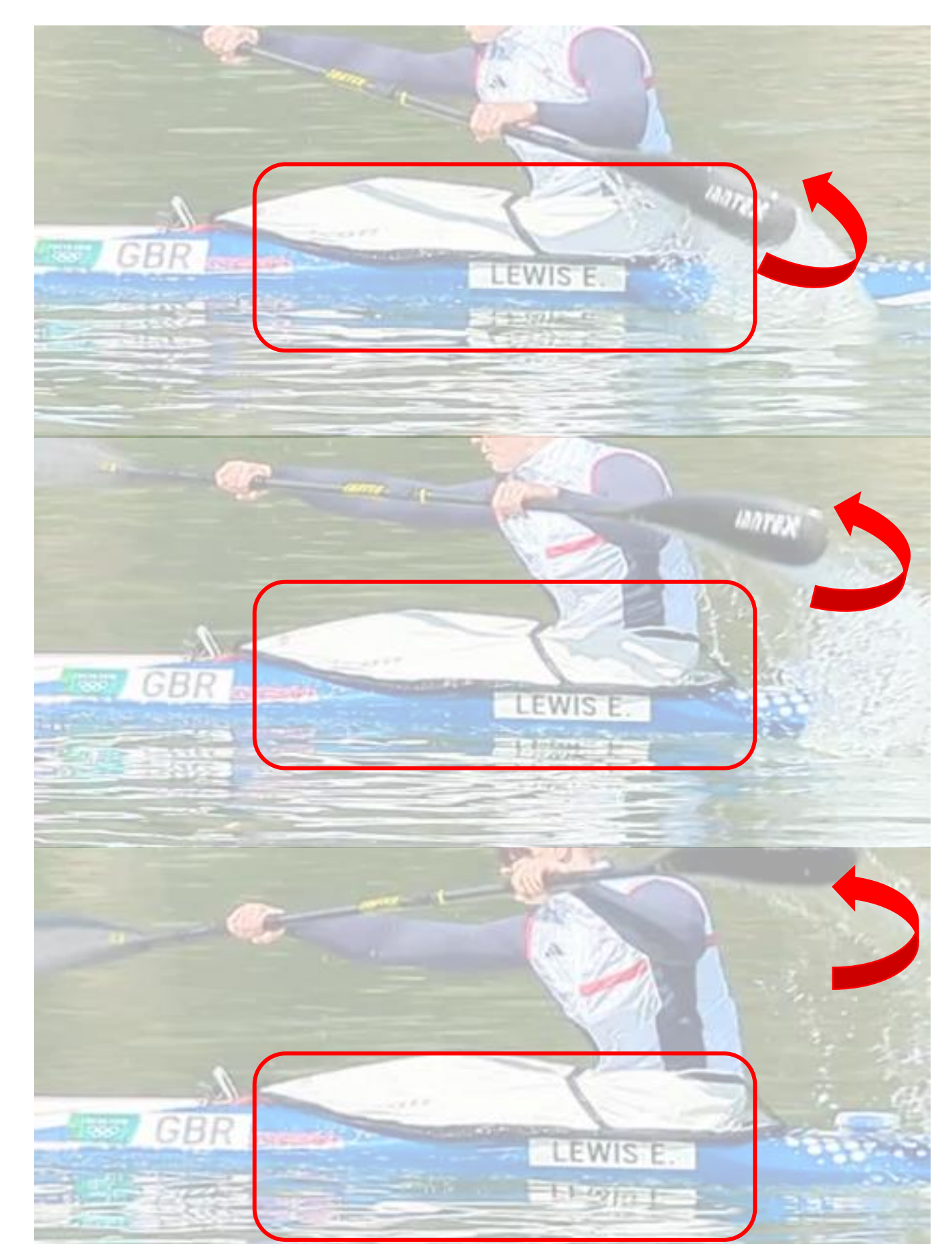
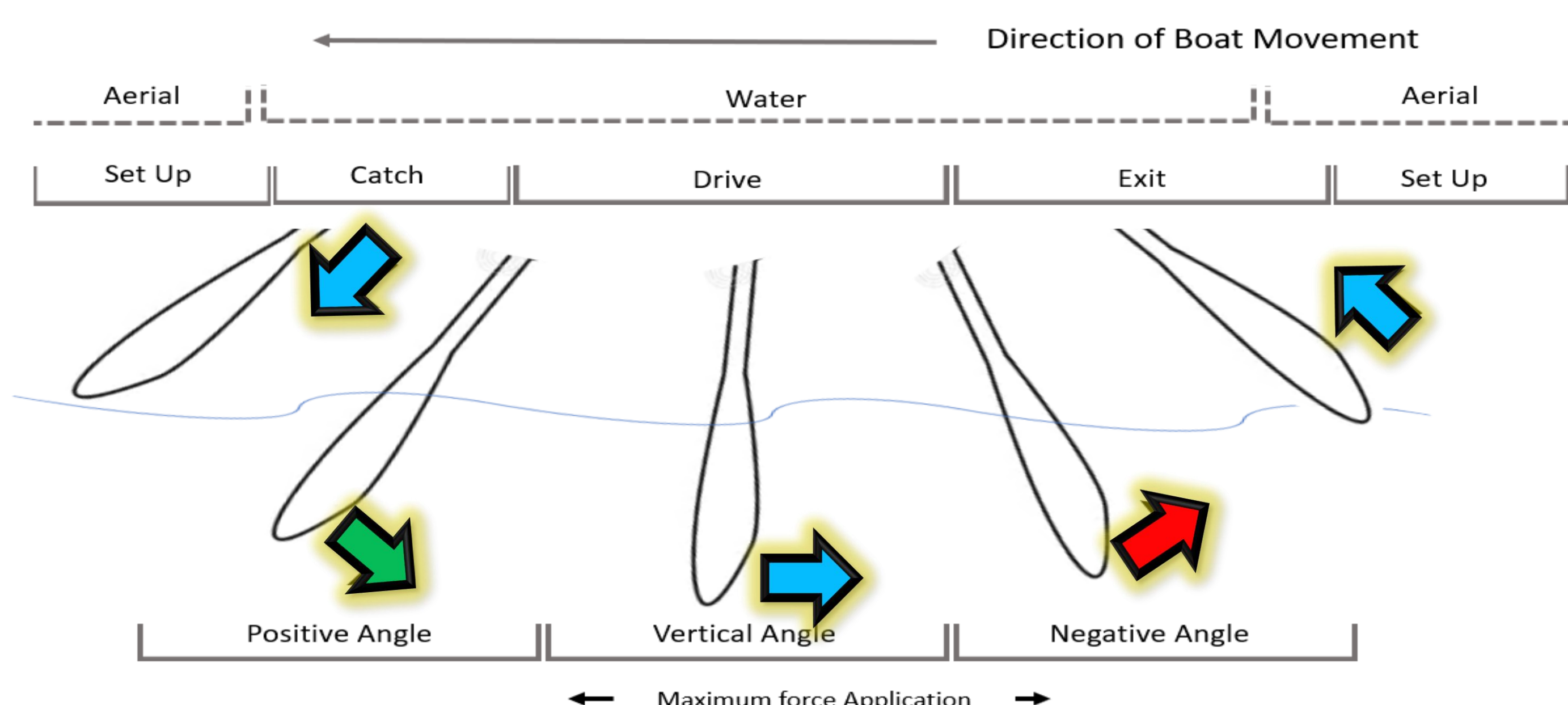


Fig 5 Hips holding boat movement stable as the blade position is recovered into the next set up phase



Paddler- Understanding the individuals movement literacy, coordination, flexibility, anthropometrics, age, stage, equipment choices, and many more areas of consideration.

Platform - Does the paddler have a solid platform, both their equipment set up and physical ability to balance. A 'solid' platform will help the paddler absorb instability and allow greater opportunity for force transfer.

Position - Can the paddler achieve, and understand the required positions of the paddler stroke. Can they do these on land and in their boat set up on the water. Are these positions restricted in any way?

Pattern - Can the paddler move through the correct pattern of movement in the correct sequence? Using the appropriate muscle groups across the connective chain? Engaging from their lowest point of connection?

Power/Propulsion - Does the paddler apply power effectively in the correct parts of the paddle stroke, and is this application done efficiently?

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Four Phase Stroke Framework

A paddlers technique is an important aspect for performance in all flatwater disciplines.

Flatwater racing is a highly technical discipline, in combination with physical qualities and a good equipment set up these together help make the boat move effectively

The technical execution of a paddler is about maximizing connection across the system and coordinating movement of the boat, body and blade to maximize forward propulsion.

The kayak stroke itself is a continuous, cyclic movement. This cyclical movement can be divided into four phases, this can help build the understanding around the principles in each phase and how they can be maximized to help positive boat movement.

Set Up



The **Set Up** Phase is a very important phase of the kayak stroke, it's the natural break/pause between single strokes. It's primary aim of this phase is to allow the paddler prepares for the next forward stroke.

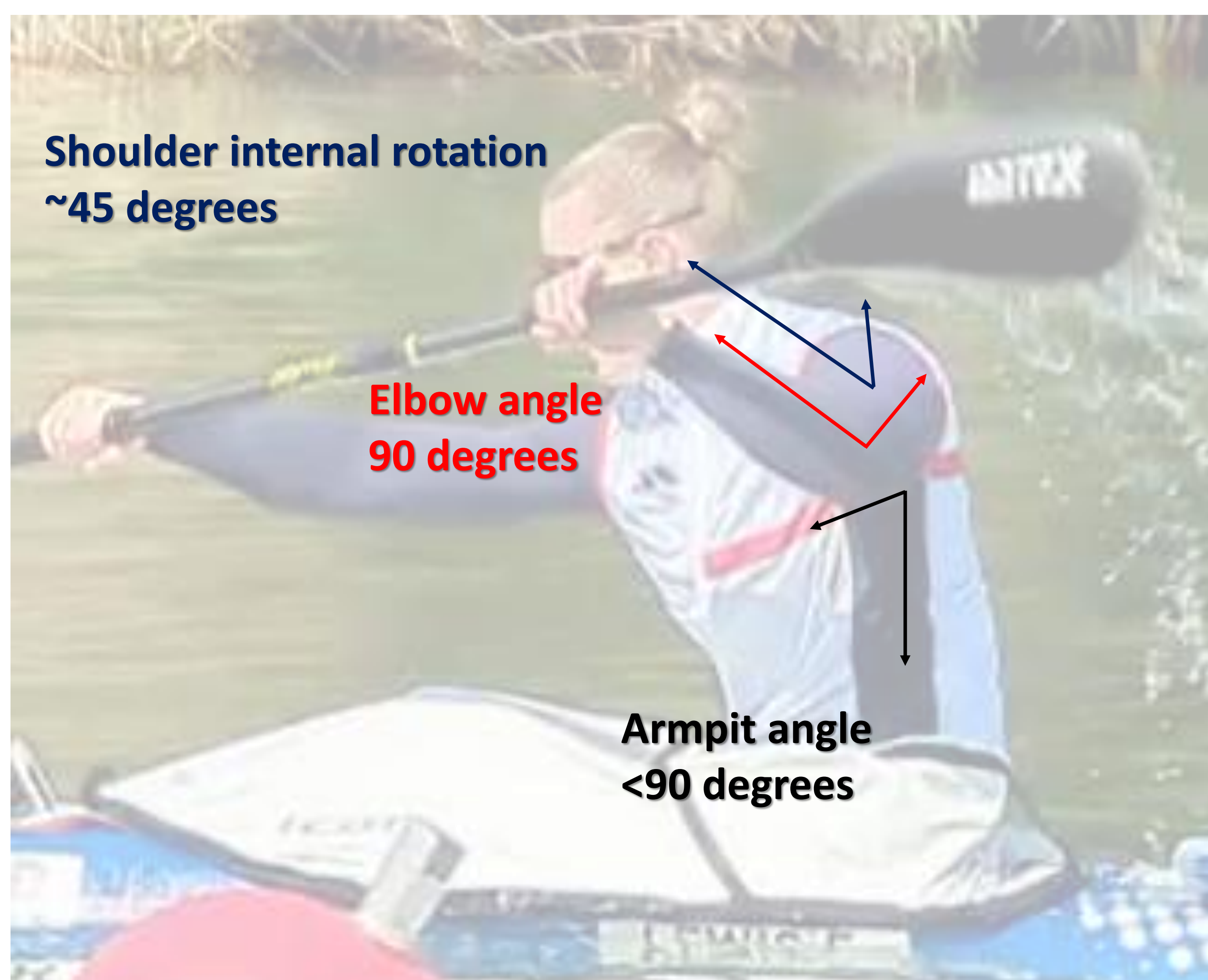


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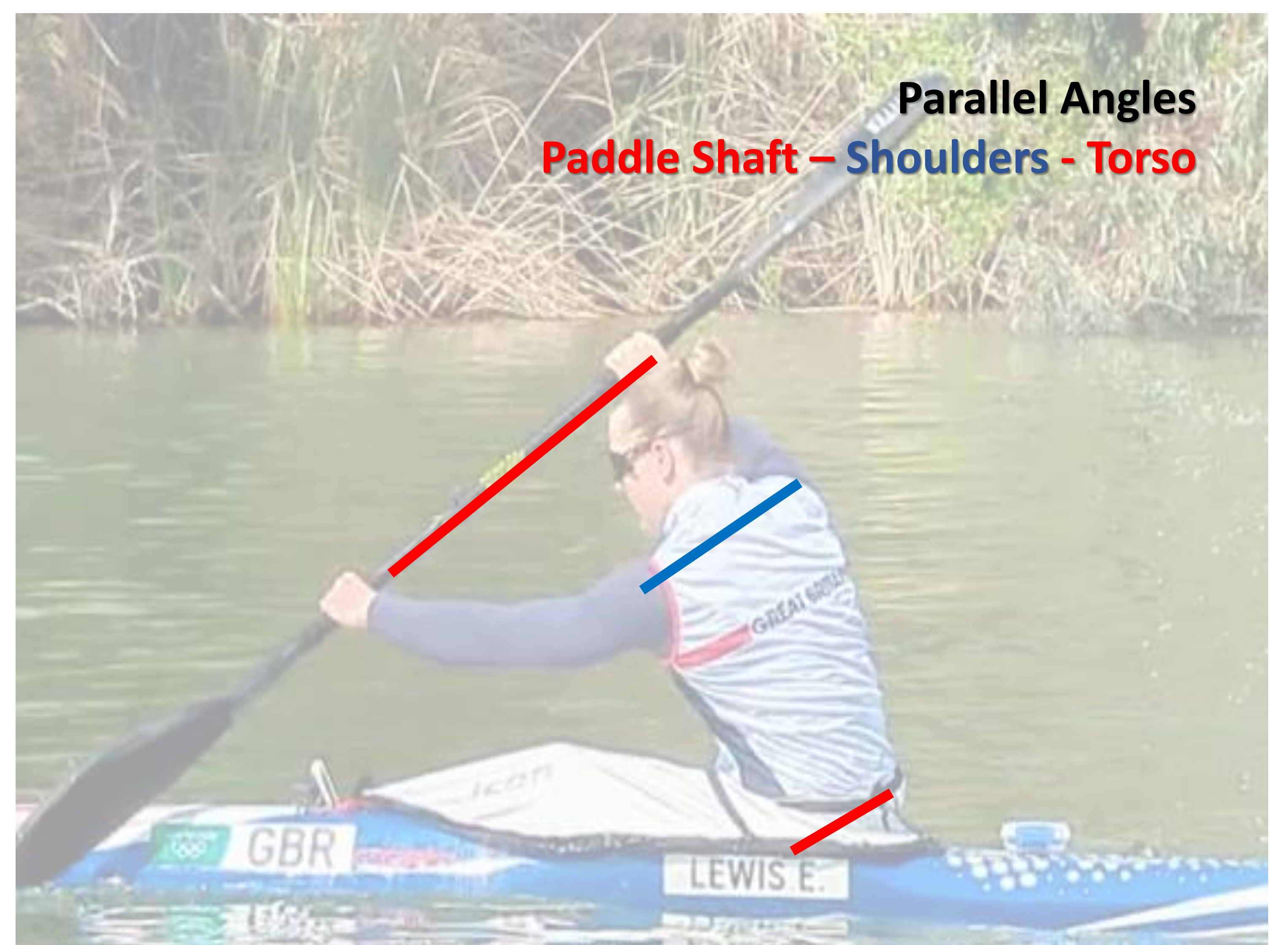


Fig 2 Roughly Parallel angle of paddle shaft / shoulder/ hips

The aims of the set up phase are for the paddler to:

- Use the natural **separation** of the stroke
- Manage the paddle angle to maximize the catch entry
- Maintain rotation from the leg/hip/torso movement gained from the end of the previous stroke
- Hold the **tension from the footrest** to control the platform
- Set **functional reach** for the next stroke

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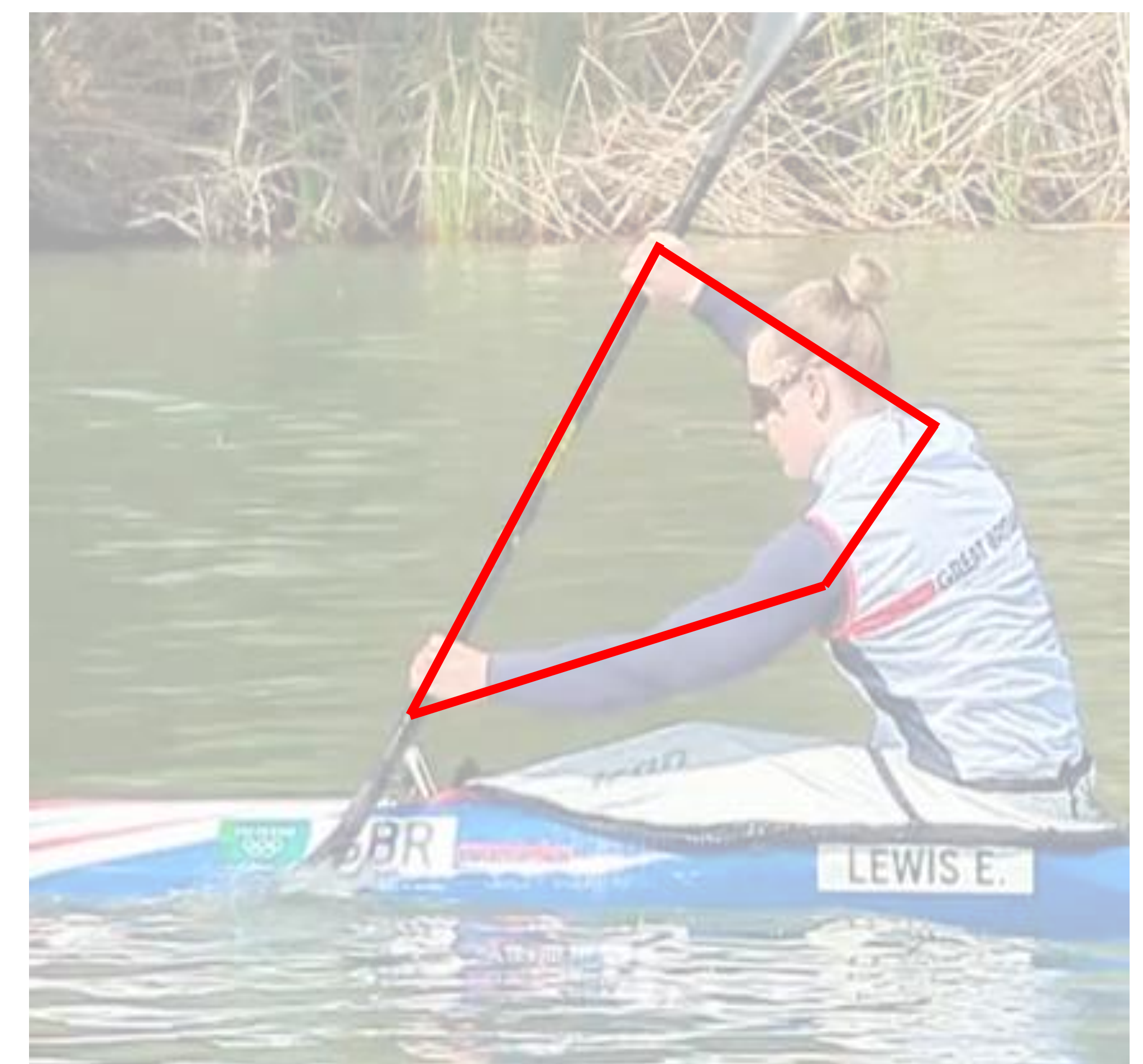
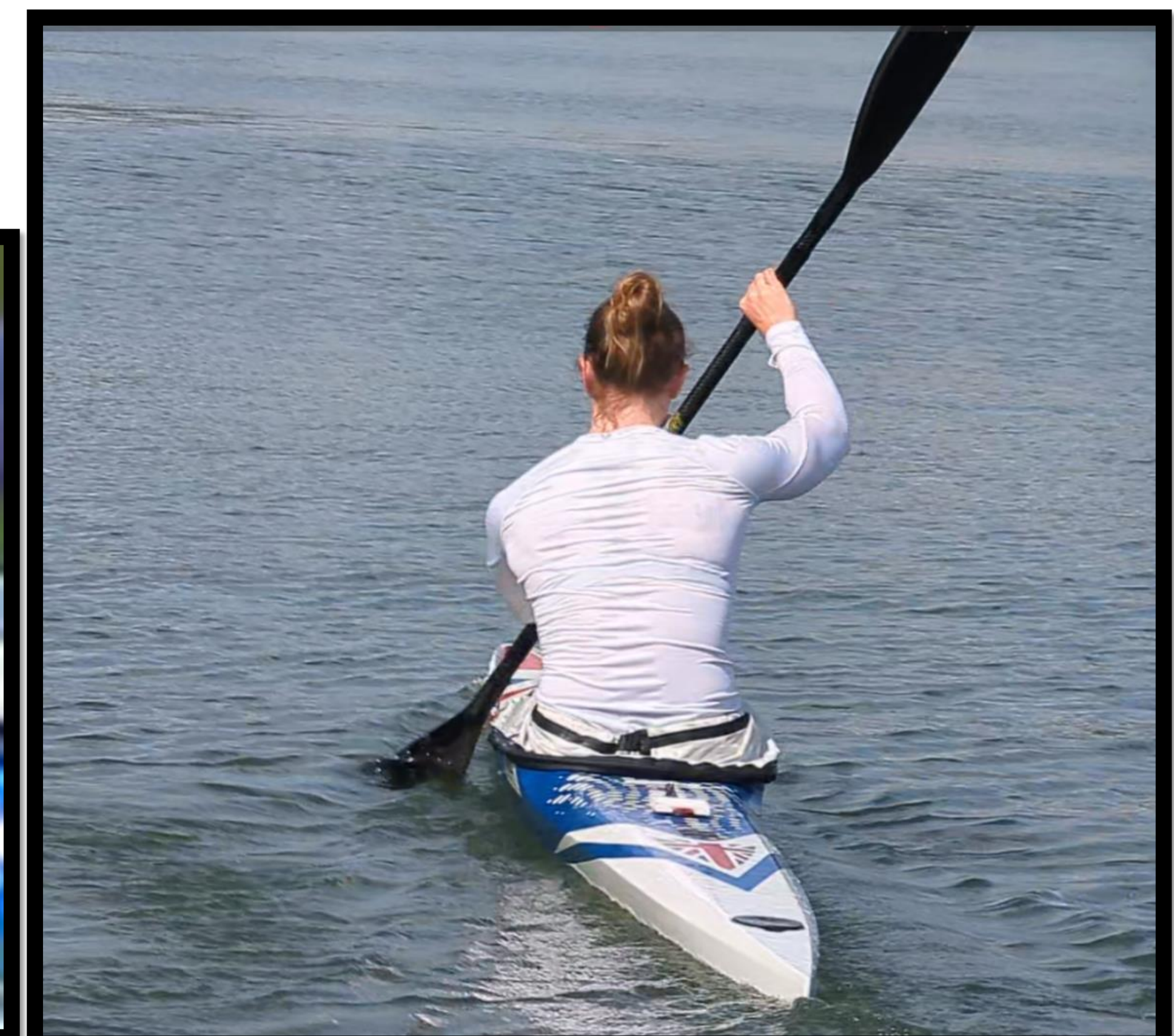


Fig 1 Holding of the frame

The aims of the catch phase are for the paddler to:

- Manage the paddle entry angle of around 60 degree to maximize **functional reach** of the stroke
- Maintain the 'frame' created between paddle shaft, arms and shoulders (fig 1)
- Use the **top shoulder** to primarily apply downward pressure to **fully submerge the blade** into the water
- Minimal loss of torso position and rotation before the blade is locked
- Continue to hold the **tension from the footrest** to control the platform across the legs and hips

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- Both hands drive with downward pressure together to bury the blade into the water
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Drive



The Drive Phase is where the paddler transfers maximal forces through the body's connective chains to generate forward propulsion of the boat. It begins when the blade is fully '**locked**' and the main driving force for this phase is the use of **leg drive** and the **paddlers rotation**. It ends when the paddle angle goes past vertical to negative

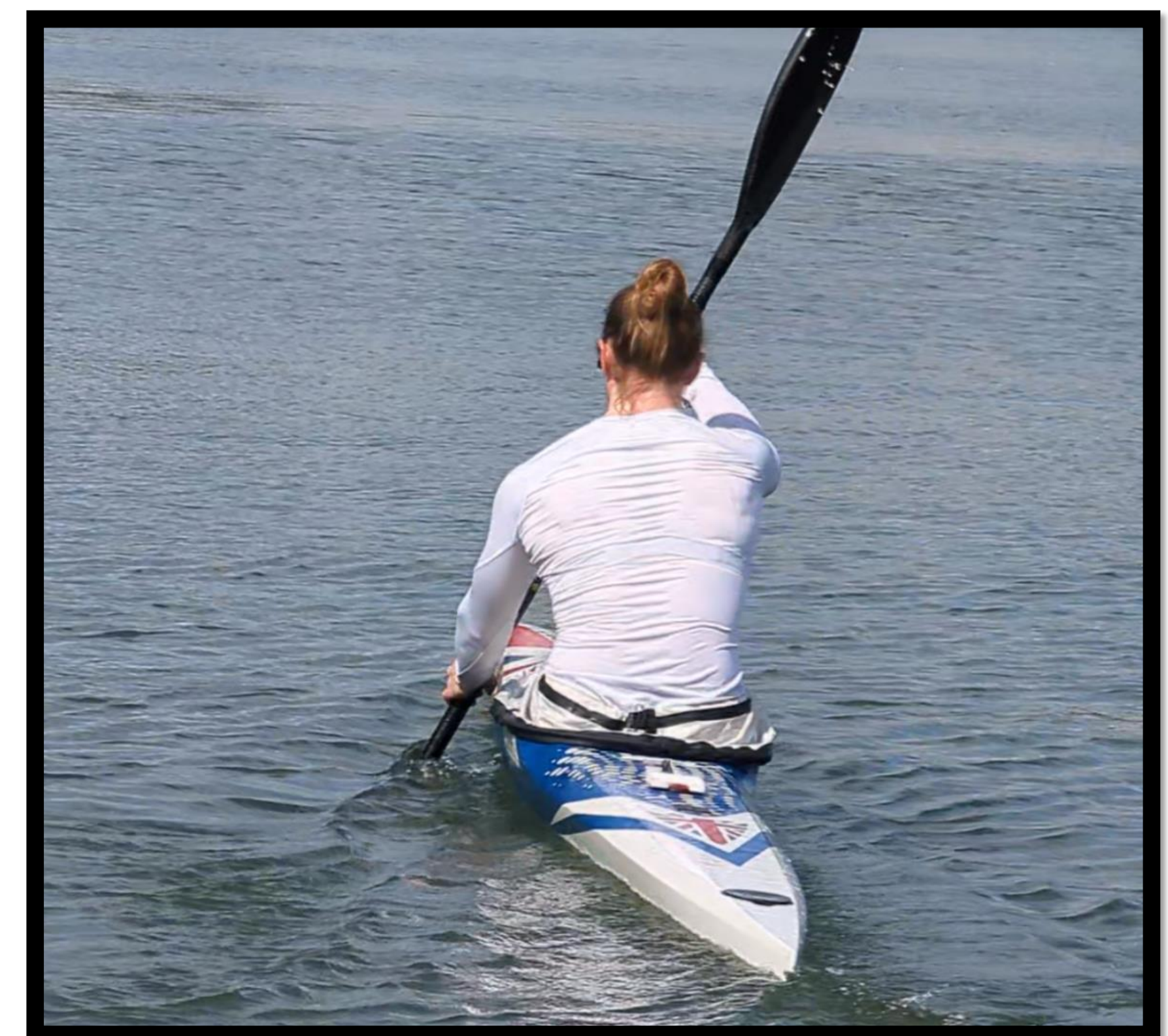


Fig 1 Paddler moving past the fixed point of the 'locked' blade relative to the fixed red bouy



Fig 2 Path of the blade through water phase of the stroke, similar to the 'wash' line

The aims of the drive phase are for the paddler to:

- Rotate past the locked paddle with whole body connection (not by the arms)
- Use the forces from initiated from **leg drive** transferred into **hip** and **torso rotation**
- Maximizing maintaining time around **vertical paddle angle** by holding the frame with a **fixed top hand** and **elbow position**
- Aim to increase the **amplitude of the stroke** through this phase, moving past the blade at greater, and greater speed
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The aims of the exit phase are for the paddler to:

- Finish the stroke with a **clean exit of the blade** from the water without lifting excessive water
- Blade is **removed** from the water before the paddlers **bottom hand passes their hip**
- **Top hand** finishes the extension forward and remains at the same level to **act as a pivot** for the set up of the next stroke
- Torso rotation is maximized forwards to help the removal of the blade from the water
- **Leg** drive and **hip position** is held to **stabilise** the boat as the blade exits the water



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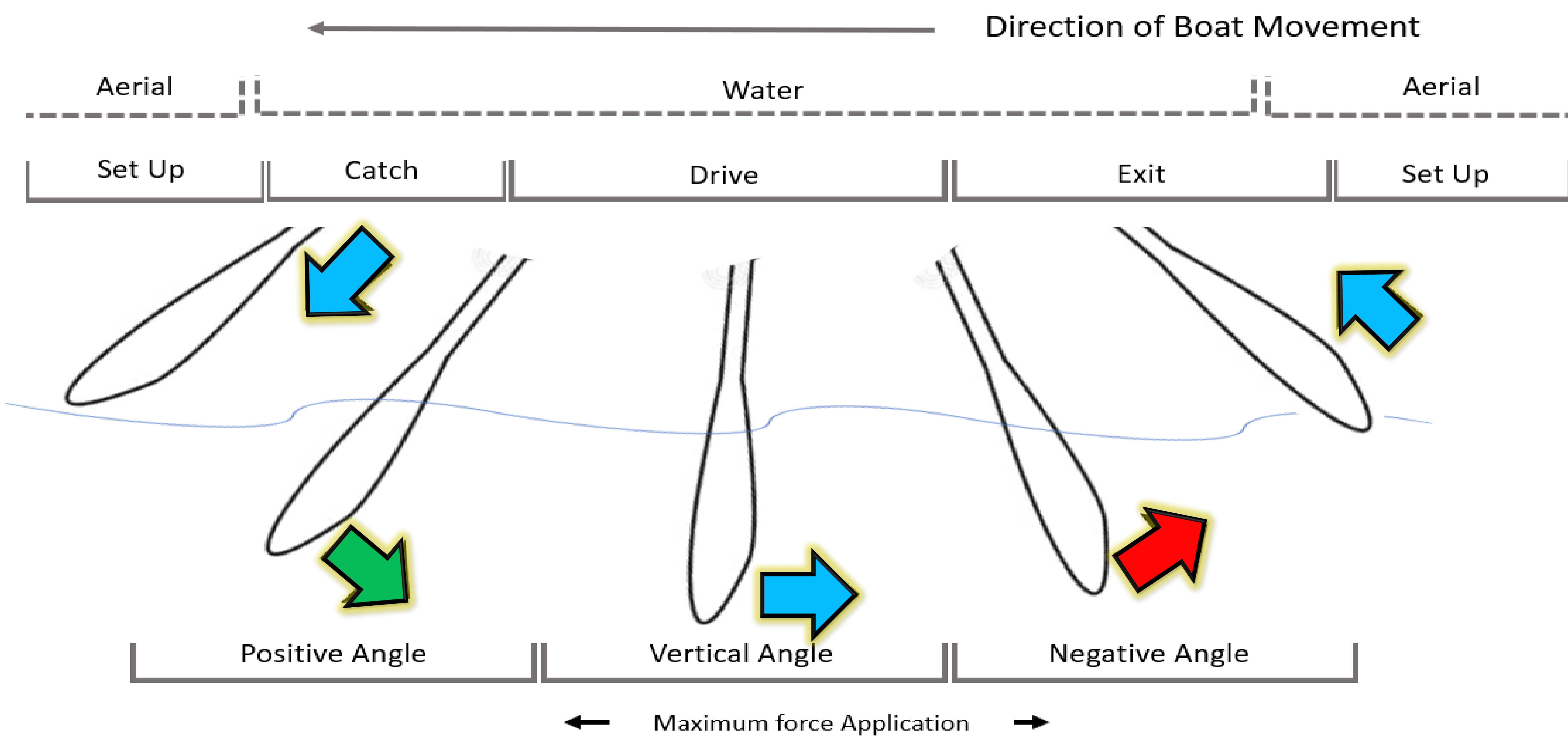


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