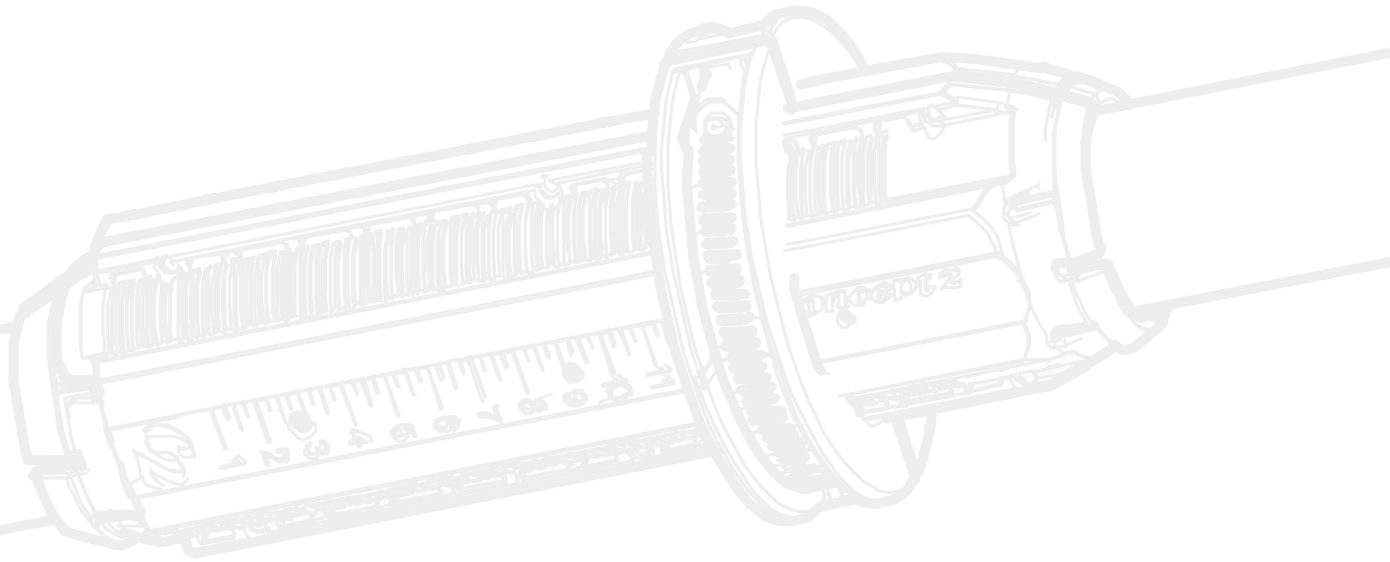


concept 2[®]

OAR MANUAL



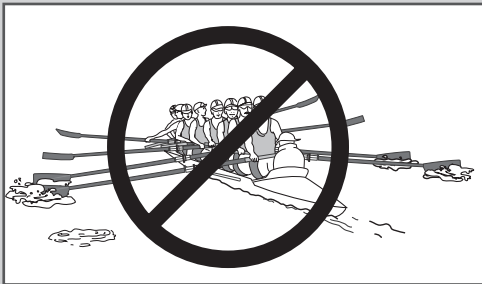
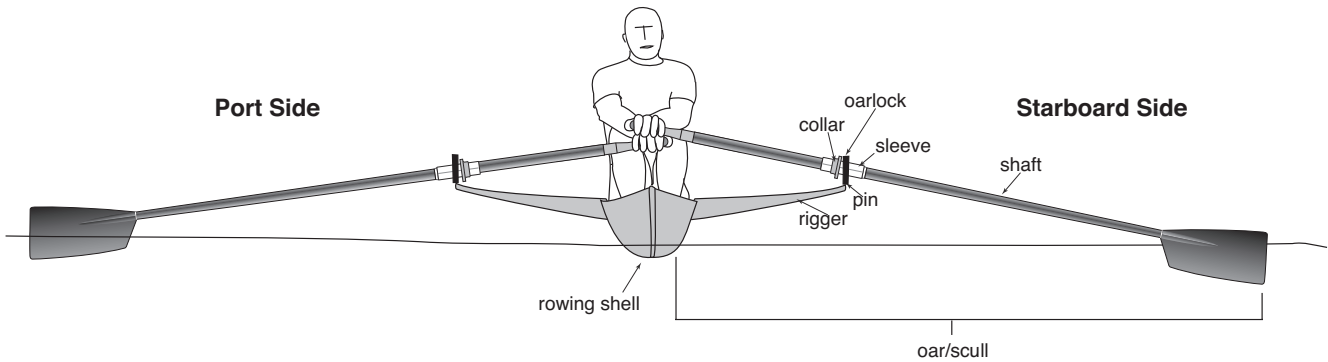
IMPORTANT INFORMATION	2
GLOSSARY OF TERMS	3
ASSEMBLY	3-5
RIGGING INFORMATION	6-10
MAINTENANCE	11-13
ALSO AVAILABLE FROM CONCEPT2	14-15
RESOURCES	15

PLEASE ENTER THE
SERIAL NUMBER BELOW:

(THIS IS PRINTED ON LABEL NEAR SLEEVE ON HANDLE END)

CONCEPT2.COM

Anatomy of an Oar



It is not advisable to row at full power if everyone in the boat is not rowing. This may load the oars beyond their design strength.

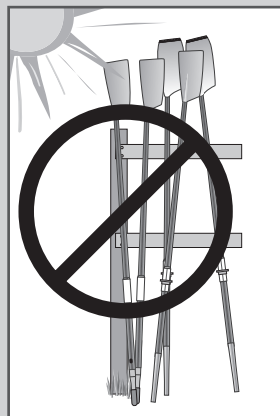


If your oars have the Vortex Edge do not paint the plastic Vortex Edge piece. You may paint the rest of the blade.



Electrical conductivity:

- Carbon fiber is electrically conductive!
- Keep oars away from power lines.



Do not store your oars long-term in continuous sunlight.

Ultraviolet light will eventually degrade the surface and shorten the life of the oar.

Storage of Wooden Handle Oars

- Keep handle out of water and away from dampness.
- Do not store oars with handles on damp ground or in wet grass.

If you have a collision, inspect your oars carefully for signs of damage before continuing to row with them. It is a good idea to do this periodically, even if no collision has occurred (see page 12).

C.L.A.M.- Clip-on Load Adjusting Mechanism: The C.L.A.M. slides on and off the shaft and fits over the sleeve to quickly adjust the inboard of an oar or scull. Adding one C.L.A.M. increases the inboard by 1 cm, thereby decreasing the load you feel on the oar(s).

Oarlock Height: Vertical distance from the lowest point on the front edge of the seat at the front stop position to the midpoint of the oarlock shelf. This determines the level of your hands during the pull phase of the stroke, when the blade is just buried. If your hand level is too low, you will not have room to maneuver and feather your oar. If it is too high, you will feel uncomfortable as you pull through the water, and your oars may tend to wash out (come out of the water prematurely) during the stroke.

Inboard: The distance from the end of the handle to the blade-side face of the collar or C.L.A.M. The greater the inboard, the lighter the oar will feel in your hands, and the lighter your load will be when pulling through the water.

Load: Also called gearing. Just as the gearing on a bicycle determines the force felt at the pedal, the load defined by certain rigging measurements determines the force felt at the oar handle. For example, you can increase the load by doing any of the following: decrease the inboard; increase the outboard; increase your reach; use a longer oar without changing inboard or spread.

Outboard: The distance between the tip of the blade and the blade-side face of the collar or C.L.A.M. The greater the outboard, the heavier the oar will feel and the greater the load will be.

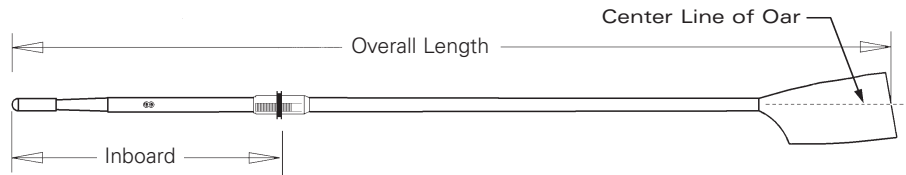
Overlap: The amount by which the hands cross each other at the midpoint of the sculling stroke. The overlap is a function of the inboard and the spread and is generally described as half of the difference between the spread and twice the inboard. Increasing the inboard will increase the overlap, unless you increase the spread accordingly at the same time. Overlap is a matter of personal preference, but is generally recommended to keep it between 12–20 cm. In general, taller people row with more overlap and shorter people row with less.

Pin: The vertical axle extending up from the end of the rigger around which the oarlock rotates. The expression “through the pin” refers to the relative position of the pins and your seat at the beginning of the stroke. If the seat passes to the stern of the pins, you are said to be rowing “through the pin.”

Pitch: The angle of the blade away from perpendicular during the pull phase of the stroke. This is the net result of the pitch in the oar itself and the pitch in the oarlock and the pitch in the pin. Too much pitch makes it hard to bury the blade; too little pitch makes it too easy to pull too deep through the water.

Spread: The distance between the two pins on a sculling boat; or the distance between the pin and the center line of a sweep boat. Spread interacts with the inboard setting to determine the overlap of your hands when the oars are perpendicular to the boat. Also, the greater the spread, the smaller the arc that your oar blades sweep through the water.

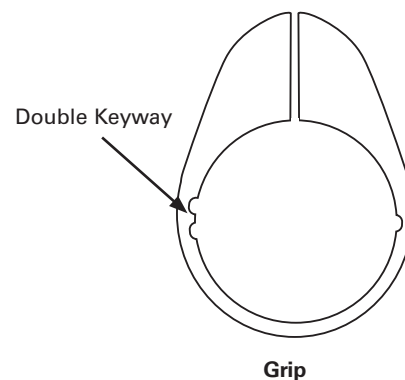
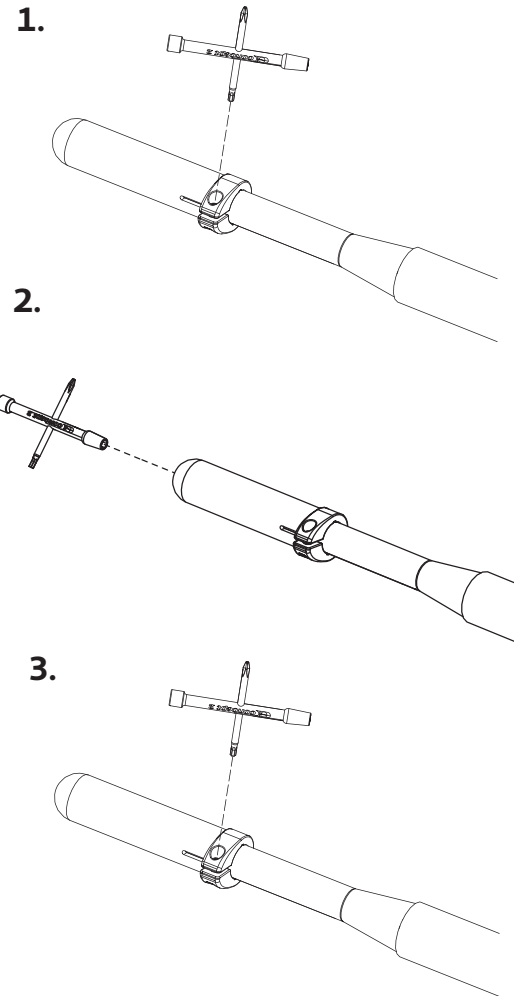
Checking the Overall Length of Your Oars



Setting Your Adjustable Handles

For ease of packaging, adjustable handles are shipped in the shortest length of their overall range. This length is indicated on the invoice packed with the oars. To adjust the handle to achieve your desired overall oar length, follow these steps:

- 1) Using a T-20 (6-lobe) screwdriver, loosen the clamping screw at the shaft end of the grip. Do not remove it; just loosen it by several turns.
- 2) Using a T-20 (6-lobe) driver, a 1/4" socket wrench/nut driver, or an adjustable speed drill with a 1/4" hex bit or a T-20 (6-lobe) bit, turn the adjusting screw at the very end of the grip until you reach your desired length. Apply a little forward pressure on the screw as you turn it. Turn clockwise to shorten the oar; counterclockwise to lengthen it. It takes approximately four turns to move one centimeter.
- 3) Tighten the clamping screw until snug to lock the handle into position. Do not overtighten. A slight gap is desirable.
- 4) If the locking clamp of the adjustable grip is facing the rower's chest, remove the adjustable grip and reinstall it by aligning the double keyway with the double key. When correctly installed the locking clamp on the grip should be facing the same direction as the face of the blade.



Setting Proper Oar Length

Overall oar length has a very significant impact on loading. In general, the longer the oar, the heavier the load will be. To determine the optimal oar length for you or your crew, it is important to consider the following factors: blade type, overall rig, rowing style, and size and speed of crew.

If you are not sure what oar length to set, we recommend that you start in the middle of the range on your oars and then apply these guidelines to fine-tune your length setting.

Here are some general guidelines to follow when setting the length of your oars:

- The faster the crew, the heavier the load can be.
- The higher the stroke rate you expect from your crew, the lighter the load should be.
- Increasing the catch angle (moving athletes further through the pin) requires a shorter oar length.
- The narrower the spread, the shorter the oar should be.
- Fat2 Blades should be rowed with shorter overall length than Smoothie2 and Big Blades. A good starting place for Fat2 Blades is 5 cm shorter than traditional blades.

Collar

Each oar has a collar that consists of two pieces, which are essentially mirror images of each other. Small pegs on the ends insure that the pieces can only be put together with the proper orientation. Either side of the collar can face the oarlock; in fact, when one side wears out, you can rotate the collars to use the other side! A large stainless band clamp goes around both pieces to secure the collar onto the sleeve. See drawing.

Step 1: Installing the Collars

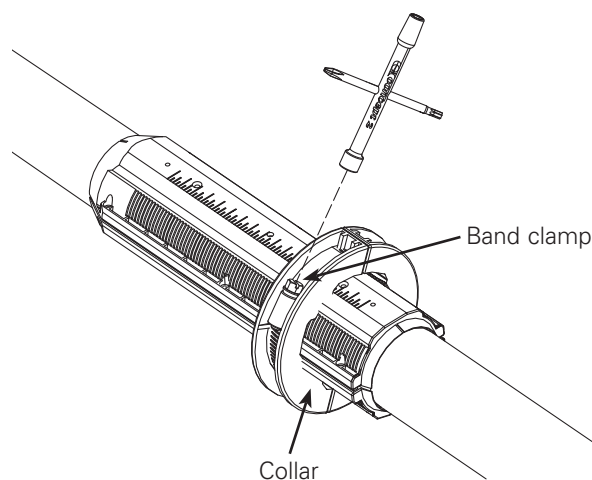
Loosely assemble the collar pieces and band clamp around the sleeve.

Note the centimeter scale on the back of the sleeve as a reference for your collar position.

Step 2: Positioning the Collars

Be sure the teeth of the collar are engaged evenly in the sleeve grooves at the desired setting, then tighten the band clamp firmly with the 5/16" nut driver on the oar rigging tool.

- **Do not overtighten the collar band clamp.**
- **Do not tighten the band clamp screw against the collar teeth.**
- The band clamp should be tight enough to keep the collar teeth engaged in the sleeve grooves at the desired setting. Over-tightening may result in warping or damage of the collar.
- The band clamp does the work.
- A slight gap is desirable.

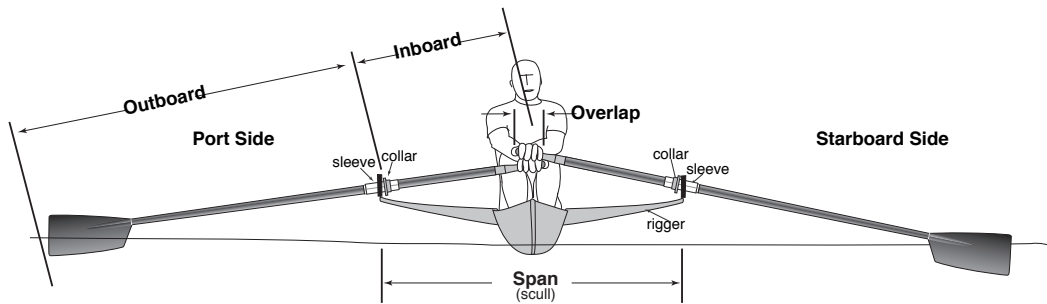


Setting Inboard

The inboard is determined by where you set the collar on the sleeve. Here are some basic recommendations.

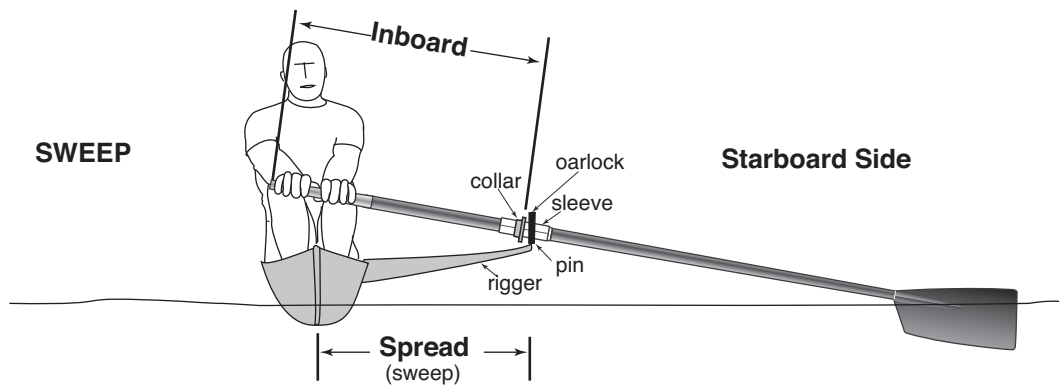
Sculls

Measure the span of your boat (the distance between the pins that hold the oarlocks). Take half of this dimension and add 6–8 cm. This will give you a reasonable inboard dimension. Measure this distance from the end of the handle and position the collars at that point. Tighten the fasteners evenly and firmly.



Sweeps

The spread of a sweep boat is the horizontal distance from the center of the boat to the center of the pin that holds the oarlock. To this dimension, add 29–31 centimeters to come up with a reasonable inboard dimension. Measure this distance from the end of the handle, and position the collars at that point. Tighten the fasteners evenly and firmly.

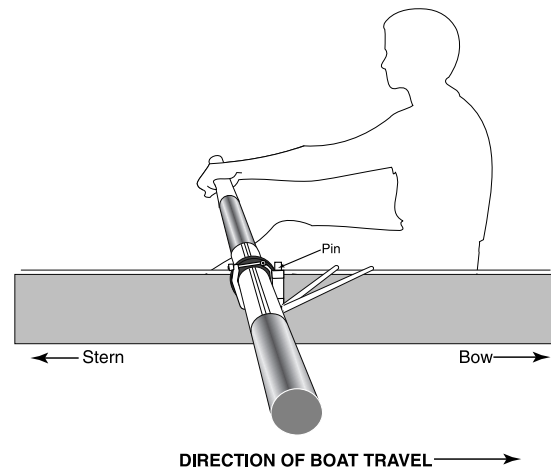


Putting the Oars in the Boat

As you sit in the boat, the port oars will be to the right of the rower, and starboard to the left. Slide the oar into the oarlock by placing the narrow portion of the shaft near the blade into an open oarlock and slide the oar out until the collar meets the inboard side of the oarlock.

Important: Close the oarlock gate before getting into the boat. Failure to do this may result in the oar coming out of the oarlock unexpectedly and your boat flipping over. The oars should be able to rotate freely in the oarlock.

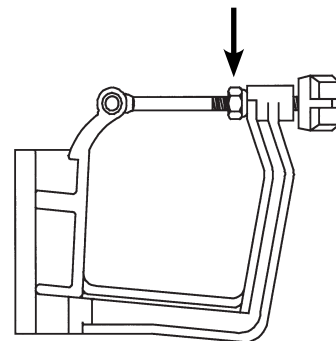
Be sure the oarlock opens toward the stern of the boat.



Oarlocks

To take full advantage of the precision shape of the sleeve, it may be necessary to fine tune the size of the opening on your oarlock. You can check for this fit by placing your oar in an oarlock and checking for smooth, non-binding rotation when going from the squared to the feathered position. If there is any binding, it can be eliminated by adjusting the nylock stop nut on the oarlock keeper to widen the oarlock. See drawing.

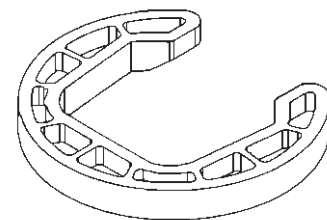
Use an 11mm or 7/16" wrench to turn this nylock stop nut to achieve smooth sleeve rotation.



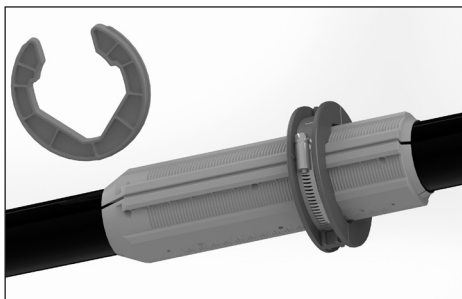
C.L.A.M.s

Our Clip-on Load Adjusting Mechanism (CLAM, for short) provides a quick way to adjust load with no tools required. It's so easy you can even do it on the water.

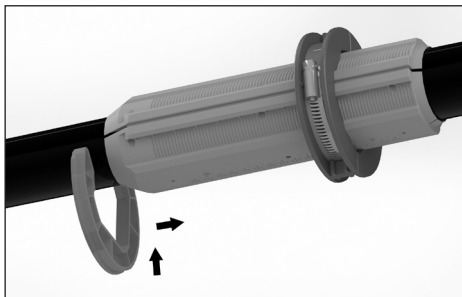
Each CLAM provides 1 cm of inboard and is a convenient alternative to moving buttons if your crews are sharing oars between an eight and a four, you'd like to quickly test different loadings with your crews, or you find yourself in a headwind after a long row. They also provide a great wear surface between the collar and the oarlock.



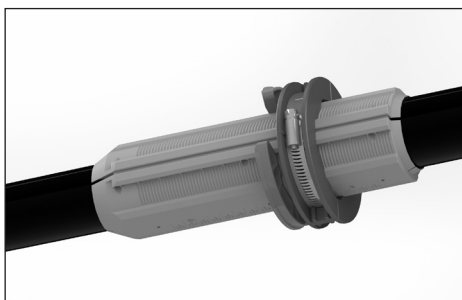
C.L.A.M.s (continued)



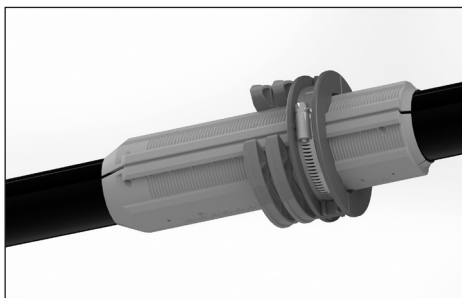
A CLAM adjusts load.



Add a CLAM to the sleeve.



1 CLAM = 1 cm



2 CLAMs = 2 cm

General Rigging Concepts

The height of your hands should be comfortable.

- If your hands feel too high, lower the height of your oarlocks. In most boats, this can be done by removing the nut at the top of the pin, and transferring washers from below the oarlock to above the oarlock. Be sure to replace the nut at the top of the pin. Alternatively, if you are not able to adjust the boat, you can raise yourself higher by using a seat pad of the desired thickness on top of the seat in your boat.
- If your hands feel too low, raise the height of your oarlocks by reversing the directions given above.

Sculling: There should be a differential in the height of your oarlocks so you can row with your left hand over your right hand, as is customary throughout the rowing community.

If your hands tend to collide at the middle of the stroke, or if your boat is constantly down to the port side, you may need to increase the height differential between your right and left hands. This differential commonly ranges from 1.5 cm to 0.5 cm.

(continued)

Sculling: You should have a comfortable amount of handle overlap through the middle of the stroke.

If it feels like you have too much overlap, decrease the inboard dimension or increase the span. Remember that decreasing the inboard will also increase your load. Increasing the span will slightly decrease the arc as your oars sweep through the water.

You should have an inch or two of clearance between your hands and your body at the finish of the stroke.

- If you do not have this clearance, try moving your foot stretchers further toward the bow of the boat. You can also decrease the inboard, but be aware that this will increase the load you feel on the oars.
- If you have too much clearance at the finish, move your feet closer to the stern of the boat.

Your oars should come through the water at a comfortable speed given the force that you are able to apply.

- If it feels uncomfortably heavy and slow pulling your oars through the water, shorten the length of your oar by adjusting at the grip, then move the collar toward the blade to maintain the inboard dimension. Other rigging adjustments that can be made to lighten the load are to increase the inboard dimension by moving the collar toward the blade. You may need to increase the spread in order to accommodate the change in inboard.
- If you feel you would like more load, lengthen the oar by adjusting at the grip, then move the collar toward the handle to maintain the inboard dimension. You can also increase the load by moving the collar toward the handle, decreasing the inboard dimension.

The oars should maintain a consistent and appropriate depth throughout the stroke and release the water well at the finish.

If your oar washes out or seems to ride too far out of the water, you may need to lower the height of your oarlocks, or you may try subtracting a degree of pitch.

NOTE: If the oar blades seem to dive too deep during the stroke: First, check to be sure that you are not pulling up on the oar. Pull evenly and horizontally. If it is not comfortable to pull at that level, adjust the height of your oarlocks to make it comfortable. If the oar continues to dig too deep, you may need to add a degree of pitch to your oarlocks.

Your seat should not hit either end of the track during the stroke.

- If your seat hits the stern end of the track at the catch of the stroke, check to be sure that your shins are not moving past vertical and that you are not rushing too fast to the catch. If you still hit the end, you should move your foot stretchers closer to the bow of the boat.
- If your seat hits the bow end of the track at the finish of the stroke, you will need to move your feet further toward the stern of the boat.

Common Ranges For Rigging Settings

	Scull	Sweep
Inboard length	85–90 cm	113–117 cm
Spread	156–162 cm	83–86 cm
Oarlock Height	depends on boat height	
Pitch	2–7 degrees	
Overlap	12–20 cm	n/a

Checking Pitch

There are several methods used to check the pitch of oars and sculls. The following describes the methods we use at Concept2 to set and check pitch.

For Comp, Fat2, Smoothie2 (with or without Vortex Edge), Big Blades, Macon and Bantam Blades

1. Clamp a piece of wood or steel to one end of a bench or other stable structure. This block should have an even top surface and must be at least as long as your blade is wide.
2. Using a bubble level and shims, level the block and secure it to the bench.
3. Position a support block ("V" blocks are helpful here) to hold the handle end of the oar off the bench.
4. Place the blade of the oar face side down on the block, with the short side corner of the blade extending 1" beyond the edge of level block.

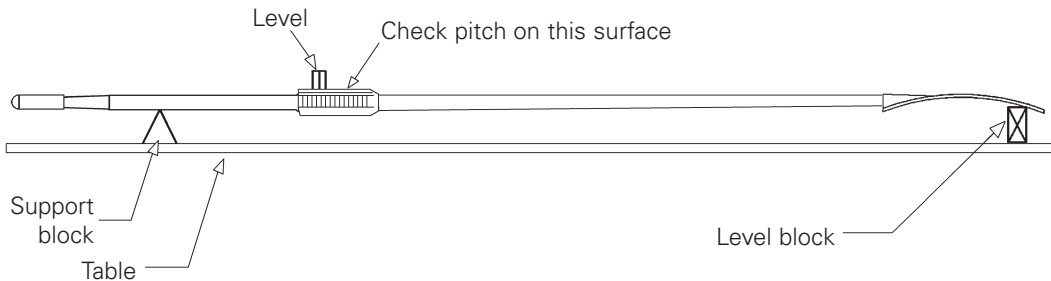
NOTE: The centerline of the oar must be perpendicular to the level block.

5. Position your level on the wear surface of the sleeve. If the surface is level, then the oar has zero pitch. If the surface is not level, then raise one edge of the level until it shows level. This will show you how much sleeve material will have to be removed to correct the pitch to zero.

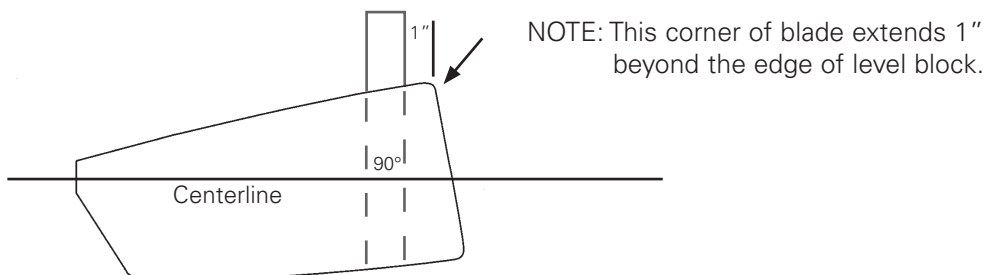
You may fine tune the pitch as much as one-half (0.5) degree by filing or scraping down the wear surface.

6. Use an adjustable pitch level for checking oars with a designated pitch other than zero.

SIDE VIEW



Shaft should be level for pitching.



General Care

- If you row in salt water, rinse oars (including shaft, blades and oarlocks) after each use with fresh water. Store oars in a dry location out of continuous direct sunlight.
- Most commercial car top racks, such as Yakima or Thule, are adequately coated to protect the oar shaft; however, unprotected tubular metal racks can cause serious damage to an oar shaft that is tied on without any padding.

Sleeve and Collar Care

It is important to keep the sleeves, collars and oarlocks clean and grit-free in order to ensure smooth feathering action and long life. It is not necessary to lubricate these plastic components. Inspect for any signs of damage periodically.

NOTE: Collar wear can be virtually eliminated by using C.L.A.M.s on your oars. See C.L.A.M. information on page 7. Note also that the collar is symmetric and can be used in either direction. When one side shows wear, you can flip the collar to use the other side.

Handle and Grip Care

Notes on Grips

- Grips are designed as a replaceable component part. Field life will vary depending on the type of grip, user care and maintenance, and rowing environment. Handles can also be replaced, but this involves more work.
- Be sure to wash your hands after applying sunscreen.

Proper care will extend the life of your grips, which can be replaced easily when they wear out. Refer to the cleaning methods for the type of grips you have.

Green Rubber, Orange Contoured, and Blue Cellular Grips:

Blue cellular grips will need frequent cleaning to maintain their grip properties. If blue cellular grips feel slimy when wet, it is time to clean your grips. The frequency of cleaning blue cellular grips will depend on your rowing environment; warm, wet or dirty conditions will force more frequent cleaning of grips.

Green grips do not accumulate dirt as readily as the blue ribbed grips, but we still advise cleaning them occasionally.

Procedure:

1. Scrub the grips with a nylon brush (the type used for cleaning vegetables or fingernails) and rubbing alcohol, or in a dilute solution of bleach and water (approximately 10 parts water to 1 part bleach). Do not soak. Cleaning the grips with bleach will have the added benefit of disinfecting them.
2. Rinse well with fresh water.

Microfiber Suede Grips:

Gently clean your microfiber suede grips on a regular basis to extend the life of the microfiber suede patches. The patches are wearing items, but under normal use can be expected to last 6–12 months. It is important to store them out of direct sunlight and in a dry location. To maintain the smooth surface finish, avoid using tape on your hands or wearing rings while rowing.

Procedure:

1. Using a soft bristled nylon brush, gently scrub grips with a diluted solution of bleach and water (approximately 10 parts water to 1 part bleach). Scrubbing aggressively will damage the grip surface finish. Do not soak grips. Cleaning the grips with bleach will have the added benefit of disinfecting them.
2. Rinse the grips well with fresh water.

Handle and Grip Care (continued)

Black Rubber and Blue Ribbed Grips:

The black rubber and blue ribbed grips will age over time with exposure to sunlight. This may result in some of the surface layer of the grip material coming off on your hands as you row. To alleviate this problem, you can clean the grips periodically by scrubbing them with water and a non-abrasive pad.

Wood and Wood Veneer Handles

Wood handles tend to accumulate oil and dirt over time. They can be cleaned and revitalized by scrubbing with a diluted solution of bleach and water (approximately 10 parts water to 1 part bleach) with a stiff bristled brush. Rinse well with fresh water.

Evaluation of Damage After a Collision or Impact

We have made your oars as durable as possible within the limits of creating lightweight racing oars. Accidents do happen, and some of those accidents may damage your oars. Some kinds of damage can be easily repaired at home; other damage may require shipping your oars back to Concept2.

1. Inspect your oars carefully after any mishap where the oar may have met excessive stress, load or impact. These mishaps may include catching a crab (particularly if the shaft impacts the rigger), hitting a bridge abutment, finding a big log in the water, or being improperly padded in transportation.
2. Do a thorough inspection:
 - a. Check for blade dents.
 - b. Inspect the shaft for cracks or bruises. Feel for soft spots on the shaft that could indicate invisible cracks.
 - c. Check for water in the shaft.
3. It is important to catch damage as soon as possible. It can be dangerous to row with a damaged oar.

Shaft Damage

In most cases of shaft damage, the oar should be returned to Concept2 for evaluation and repair.

Blade Damage

Blade damage most often occurs at the edge of the blade due to scuffing or hitting against something. This kind of damage can generally be repaired fairly easily with some sanding and epoxy. If there is more serious structural damage to the blade, it can be replaced. Please contact your local Concept2 representative for more information about blade replacement options.

Shipping Oars Back to Concept2 or Your Local Concept2 Authorized Reseller

You MUST contact Concept2 or your Concept2 Authorized Reseller for prior authorization before returning your oars for warranty or repairs.

For a complete list of Concept2 Resellers in your area, go to concept2.com/dealers.

Painting Your Blades

If you would like to change your blade color or apply additional paint or designs, select the proper method below depending on what kind of factory-finished blade you have. We recommend reading through the entire procedure before you begin painting your blade.

Painting Factory-Finished Blades

(Blades finished with the standard white powder coat)

Your blades have been finished with an abrasion-resistant epoxy powder coat system. With appropriate preparation, this finish is compatible with most other finish coats such as acrylic enamel, acrylic urethane, urethane, or epoxy paint. If you would like to change your blade color or apply additional paint or designs, prepare your blades for painting as follows:

1. Using gray spray primer, apply a light dusting, or “guide coat,” of primer on both sides of the blade from a distance of 18–20 inches. This will act as a visual guide when sanding and will expose any low spots or imperfections during the surface prep. Allow to dry for 5–10 minutes.
2. With 220 grit paper, hand sand or use an orbital sander to sand both sides of the blade to a dull finish. (An orbital sander will provide the best prep with the least amount of effort.) **IMPORTANT:** Proper paint adhesion requires that the blades are thoroughly sanded.
 - a. To sand by hand:

Start sanding in a corner of the blade. Work your way across the blade surface removing the previously applied guide coat. Sand the other side.
 - b. To sand with an orbital sander:

Sand the back surface of the blade up to and around the cone area. Hand sand the cone area. Sand the front of the blade.
3. Using rubbing alcohol on a lint-free cloth, wipe both sides of the blade to remove the sanding dust. Allow the alcohol to evaporate completely.

IMPORTANT: Before priming and painting your blade:

- a. Mix and apply the primer/paint per the manufacturer’s instructions.
- b. Test the primer/paint on a small portion of the sanded blade to ensure that it does not bubble or easily scrape or peel off.
- c. **DO NOT** paint the vortex edge/cap.
4. Prime the blade with a primer that is compatible with the finish coat you are using. Follow the instructions from the primer manufacturer to prepare the primer.
5. Mix the paint (and thinner if appropriate) per the manufacturer’s instructions. Using a bristle or foam brush, apply paint in light coats starting with the edges of the blade, making sure to smooth excess paint on both blade surfaces. Start at one end of the blade surface and apply the paint in smooth, even strokes. Allow the paint to dry per the manufacturer’s instructions before recoating to your desired finish. Note: One coat will not provide good results. We recommend lightly applying multiple coats. Applying thick coats may produce paint runs and improper curing.

Painting the Bantam Blade

The Bantam blade is made of polypropylene, a similar thermoplastic as the bumpers on most cars today. You must use a paint system formulated for this type of plastic (also referred to as PP or TPO), or the paint will not stick.

We recommend shopping at your local auto supply store for “bumper paint” for the base color of your blade. A bumper paint system may include a cleaner and an “adhesion enhancer” or primer. **FOLLOW THE MANUFACTURER’S INSTRUCTIONS.**

We have tested these brands with good success:

- SEM®
- Dupli-color®
- Urethane Supply Company® brands.

Test one side of one blade first before painting a fleet of blades. Follow the manufacturer’s instructions for how to add additional designs or stripes to your base color.

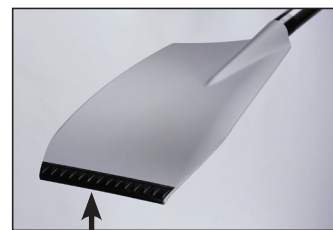
Painting Your Blades (continued)

Painting Factory-Finished Blades

(Blades finished with a custom paint color from Concept2's Custom Urethane Color Option System)

Your new blades have been finished with a custom color from Concept2's Urethane Color option system at the Concept2 factory. With appropriate preparation, these finishes are compatible with most other finish coats such as acrylic enamel, acrylic urethane, urethane, or epoxy paint. If you would like to apply additional color(s) or apply additional designs, prepare your blades for painting as follows:

1. Sand the portion of blade to be painted with 220 grit sandpaper.
2. Wipe the blade clean with alcohol or automotive paint degreaser.
3. **IMPORTANT:** Test the paint on a small portion of your blade before painting the entire blade. Let the paint dry completely to assure proper adhesion. Be sure it does not bubble or easily scrape or peel off. If it does, please contact Concept2 for assistance.
4. Spray or brush the rest of the blade with your finish coat of paint. If your oars have the Vortex Edge, **DO NOT** paint the plastic vortex edge cap.



Note: If your oars have the Vortex Edge, **DO NOT** paint the plastic vortex edge cap.

ALSO AVAILABLE FROM CONCEPT2

Oarlocks

Concept2 oarlocks are shaped for easy oar handling with positive stable positioning on both drive and recovery. Oarlocks are sold in pairs with replaceable bushings to accommodate pin diameter and varying degrees of pitch. Our oarlocks are made of unbreakable, "Supertough" nylon and feature stainless steel gates. They meet FISA standards for oarlock turning diameter.



Bushings

Important: Pin diameter must be specified at time of order to determine what size bushings you will need. Order your bushings by color. Refer to the following chart.

Bushing Color	Pin Diameters	
	Sweep	Scull
Black	9/16 in	1/2 in (& adapter*)
Blue	13 mm	13 mm
White	1/2 in	7/16 in

*Adapter for "crescent" type scull backstand fits into black 1/2" scull bushing.

Universal blue bushings are sold individually; two bushings are required per oarlock. White and black bushings are sold in units called rakes. Each rake of bushings is enough for two oarlocks.

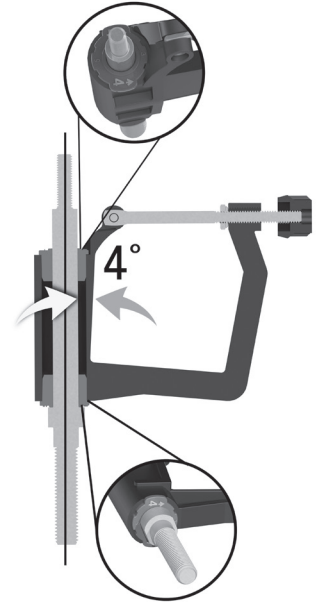
Adjusting Pitch with Bushings

Universal Blue Bushings

Our universal blue bushings provide 3–5 degrees of positive oarlock pitch. For four degrees (the most common), point the imprinted arrows toward the gate on both the top and bottom of the oarlock. For three or five degrees of pitch, face the desired pitch value toward the gate on the top and away from the gate on the bottom, similar to the white and black bushings. If you have a 13mm pin and are looking for 1, 2, 6, or 7 degrees of pitch, the traditional style blue rakes are still available. Please call Concept2 to order.

Black and White Bushings

Select two bushings with the desired pitch (1–7 degrees) and insert them in opposite directions to achieve desired pitch. The bushing with the desired pitch should be inserted with that number facing the gate on top and the opposite direction—away from the pin—on the bottom.



Scull Case

Our Scull Case is a rigid, plastic carrying case that will protect your sculls during travel, shipping, or storage.



Oar Carrier

The Concept2 Oar Carrier helps you carry four sweep oars or two pairs of sculls so that they are balanced for carrying and protected on the way to and from the dock.

concept2.com/oarcarrier



Concept2 maintains information on oar maintenance and repairs at concept2.com/service/oars. Video tutorials are also available for some repairs.

RESOURCES

Concept2 travels to several regattas each year to assist regatta competitors with any service needs. Visit us online for a list of events.



OARS | ROWERG | SKIERG | BIKEERG