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## **Ron Rantilla Rowing Systems**

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# General Description

The FrontRower is a “drop-in” rowing system for installation in open canoes and touring type rowboats. It is a complete system including oars, oarlocks, frame, seat, and pedals. It is different from conventional rowing systems in the following ways:

1. It is operated facing forward, rather than backward.
2. The oarlocks are on the innermost ends of the oars, rather than in the middle.
3. It uses pedals attached to the oars by ropes and pulleys to develop leg power, rather than a sliding seat.
4. It can be operated by arm power alone, or leg power alone, or arms and legs together.
5. The oars lift, feather, and return to the front automatically.
6. It has a comfortable seat with an adjustable reclining backrest.
7. The seat adjusts fore and aft (like a car seat) for different size rowers.

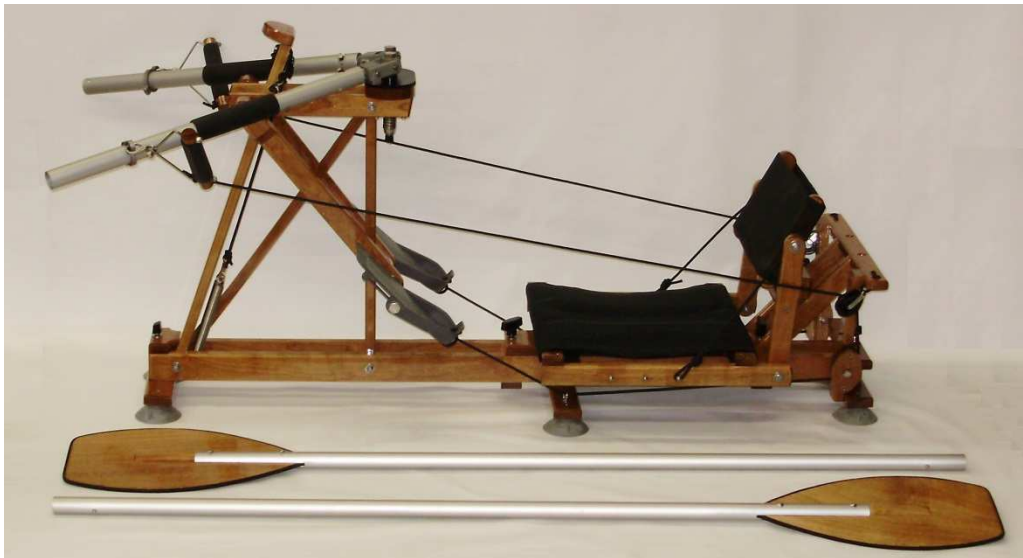


Fig. 1. FrontRower rowing system

# Unpacking and assembly

Carefully unpack and remove packaging material.

The unfinished wood parts are for packaging only and can be discarded.

You should find an extra pair of springs. These are “return springs”, which you will need to replace after 500 miles of rowing. To remove them, unsnap at the top of the springs and swing them down and off the bottom of the hooks.

You will also find mounting pads for securing the FrontRower down in the bottom of your canoe.

And you should find a DVD with rowing instructions.

Use the wooden dowel pin provided to temporarily hold the bottom of the diagonal brace in place while installing the tower (see fig. 2 and fig.3).



Fig. 2. Wooden dowel pin

Remove the three stainless steel wood screws at the front of one of the two main beams (one screw is on top and two screws are on the bottom (see fig.3).

Position the tower between the main beams of the frame (see fig.3).

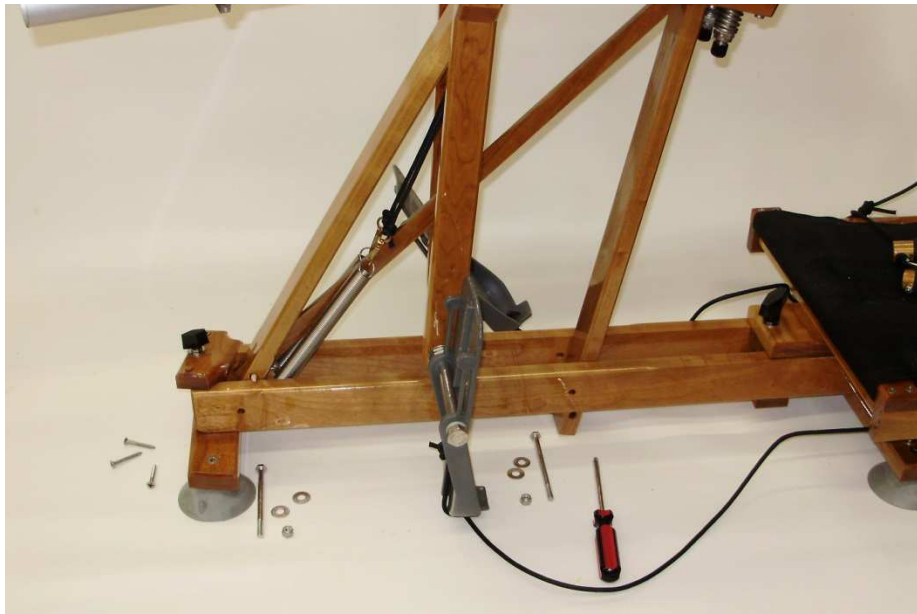


Fig. 3. Position the tower between the frame beams

Spread the beams slightly apart and slide the tower in place with the dowels fitting into the holes in the frame (see fig. 4).

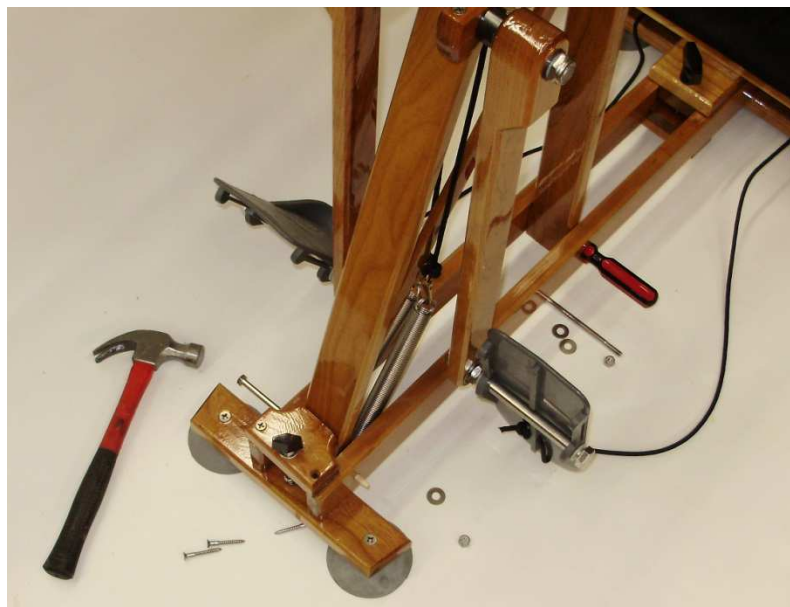


Fig. 4. Installing the 4 inch long bolts

Place a washer on the 4 inch long bolts and tap them into place pushing the dowel pins out (see fig. 4). Install washers and locking nuts. Tighten the locking nuts snugly, but not so tight that the wood is crushed. Then reinstall the three wood screws.

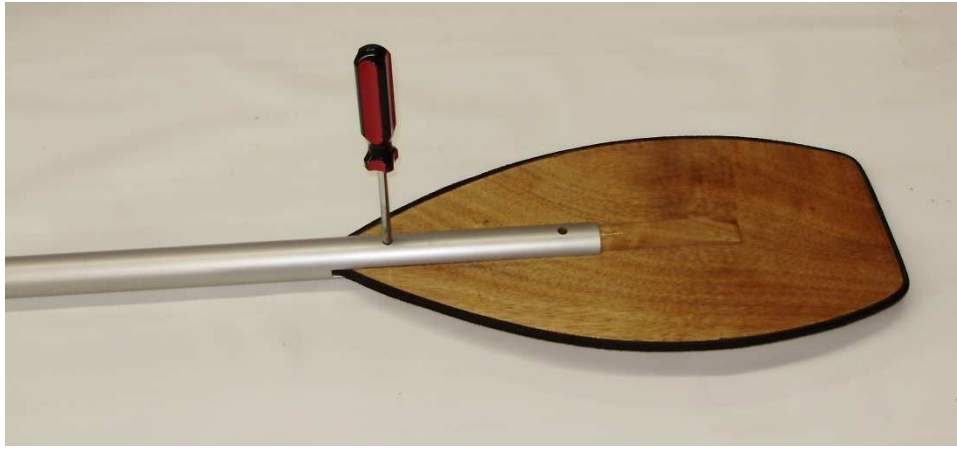


Fig. 5. Oar blade

Install the oar blades in the oar shafts, using the barrel nuts, machine screws, and washers provided. To align the holes, it helps to use a phillips head screwdriver as shown (fig. 5). Tighten the screws securely.



Fig. 6. Return spring s-hooks

Connect the s-hooks on the return spring ropes to the eyebolts on the oar tubes (see fig. 6).



Fig. 7. Swiveling power handles

Connect the power handles to the collars on the oar tubes with the rope end of the handle down (see fig. 7).



Fig. 8. Seat back support ropes

Loop the seat back support ropes on either side of the seat around the stainless steel acorn nuts on the lower sides of the seat (see fig. 8). The seat back has three positions, adjustable by repositioning the ropes on each side of the seat. Make sure both ropes are set to the same position on each side.

Note: The seat in fig.8 is set to full recline position, but this is only for very relaxed rowing. Most of the time you should have it set to the full forward position.





Fig. 9. Seat position numbers

The seat adjusts fore and aft (like a car seat) for different size people. To adjust the seat, loosen the two black knobs (one at the front and one at the rear of the seat) about two complete turns and slide the seat forward or aft. There are reference numbers from 1 to 7 marked on the frame, which helps you reposition the seat after someone else has used it (see fig. 9).

Have a seat and give it a “dry” run. (Be sure to disconnect the handles and the ropes before sitting down or getting up so you won’t trip over the ropes).



Fig. 10. Optional umbrella/fishing rod holder

The optional umbrella holder/fishing rod holder mounts to the tower vertical strut with (2) #10 wood screws provided. If strut is not pre-drilled, drill 13/64 inch diameter holes at 8 inches and 13-1/2 inches up from bottom of strut on the centerline of the strut.

# Boats for Use with the FrontRower

Boats for use with the FrontRower must be the right size and shape.

Most tandem recreational canoes are the right size and shape, and make excellent rowing boats.

The FrontRower needs an open cockpit area at least 60 inches long and 16 inches wide on the floor of the boat and 24 inches wide at 12 inches above the floor.

The maximum beam should be 37 inches or less across the gunwales. If the boat is wider than that, it may limit the forward swing of the oars (unless the boat has very low freeboard).

The FrontRower must be mounted low in the boat, on the floor (not on the seats or decking).

Note: With a rowing boat, you cannot recover from a roll over (like you can with some kayaks), so any boat used with the FrontRower must have enough stability to stay upright in the conditions in which it will be used.



# Typical Canoe Installation

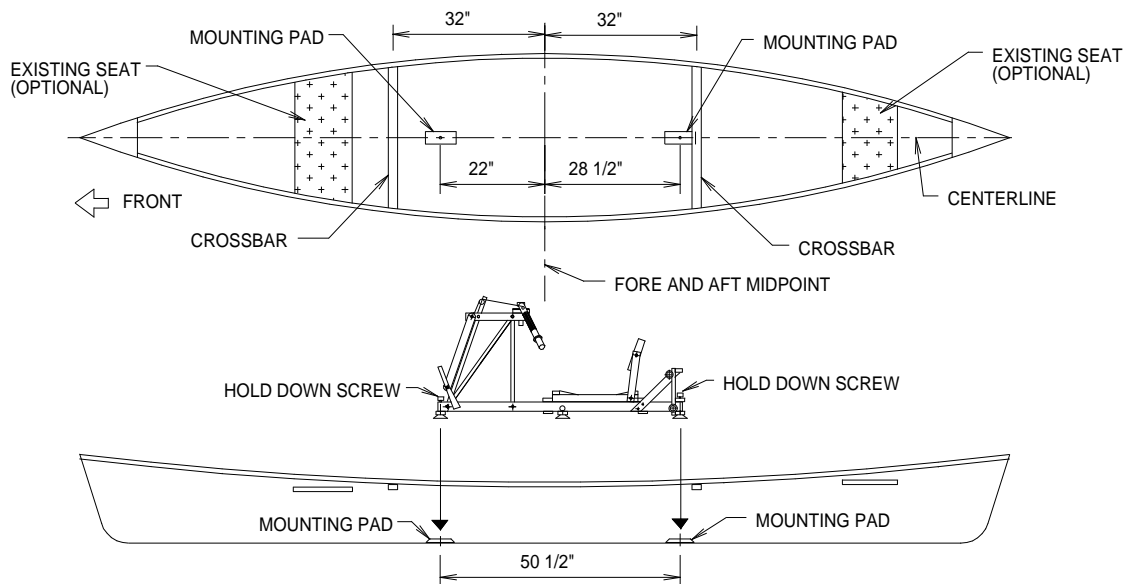


Fig. 11. Canoe installation.

Most canoes have one crossbar (thwart) across the center of the boat. For solo rowing, you should sit in the middle of the boat, so this crossbar will need to be removed. Canoes need crossbars for structural strength, so you will need to install two new crossbars to make up for the one you took out.

Two hold-down screws (one at the front and one at the rear) hold the FrontRower in place. They thread into mounting pads, which are permanently glued into the bottom of the boat. This allows easy removal for storage or transportation.

The mounting pads should be installed in the location shown above. To find the lengthwise centerline of the boat, lay a board across the gunwales, clamp it down and put a mark on the board midway between the gunwales. Then project the mark down to the boat bottom using a carpenter's square and put a mark on the floor of the canoe. Do this in two places (near the bow and near the stern) then snap a chalk line between them. Trace around the pads with a pencil or magic marker, then scuff inside the marked area with coarse sandpaper before gluing.

Glue the pads in place. For fiberglass or kevlar boats, you can use Loctite Marine Epoxy available at Lowes. For aluminum or roto-molded boats, use 3M 5200 adhesive, available at West Marine. Apply adhesive to both mating surfaces (the bottom of the pad and the floor of the boat). Then push the pad into place and scrape away any excess glue with a tongue depressor or squeegee.

Check the distance between the holes before you let the glue set up. It must 50-1/2 inches (plus or minus 1/32 inch).

Allow time for the glue to cure before using.

# Tips on Boarding and Disembarking

Always disconnect the swiveling oar handles from the collars and place them on the floor to the side of the seat before getting in or out (see fig.12). This gets the ropes out of the way and allows the pedals to swing forward so you have enough room to step on the floor behind them.

When boarding from a beach, position the boat parallel to the shoreline, not perpendicular. Then you can step in from the side (usually without getting your feet wet).

If boarding from a dock, it is recommended that you sit on the edge of the dock, place both feet in the boat, and then ease yourself down into the seat.

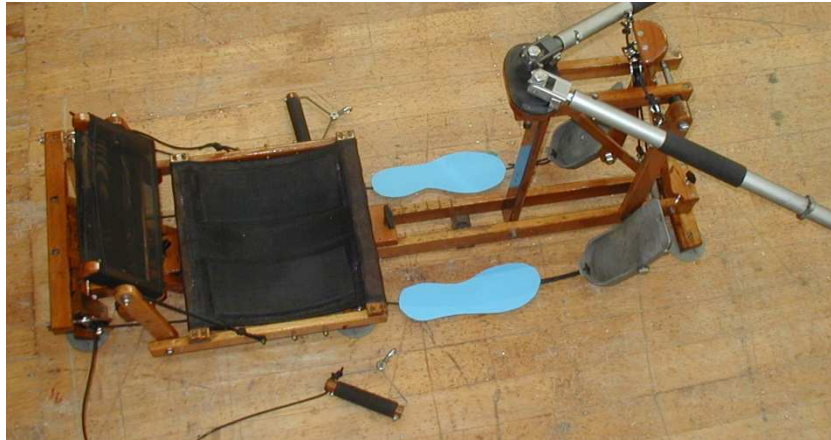


Fig. 12. Where to step when boarding or disembarking

Place one hand on the half-moon shaped handle at the top of the FrontRower and your other hand on the gunwale of the boat (or on the dock) as you step in. Step on the floor of the boat behind the pedals (see fig. 12). Lower yourself down into the seat while holding the half-moon handle. You can also use the handle to pull yourself up when getting out.

Once you are seated in the boat, snap the oars in place, connect the handles, and connect the return spring ropes.

Note: When connecting the swiveling handles, the end with the rope attached goes **down**.

# Rowing Instructions

## Set Up

### Hooking up the handles

You should always get in and out of the boat with the handles unhooked so you won't trip over the ropes. Hook them up with the **rope end down**.

### Seat positioning

For all the basic strokes, the seat back should be in the most upright position. Scoot your butt all the way back in the seat and keep it there. It is important that you are centered in the seat and not off to one side (causing the boat to tilt). Check by looking down at the seat clamping knob at the front of the seat and make sure you are centered over it.

### Seat track settings guide

For different height people the seat can be moved fore and aft (like a car seat). There are position numbers on the slide track for reference. Clamping knobs are located at the front and back of the seat. (Use these settings as a starting point).

Height: 5'-2" 5'-4" 5'-6" 5'-8" 5'-10" 6'-0" 6'-2"

Position: 1 2 3 4 5 6 7

### Propulsive strokes vs. maneuvering Strokes

Propulsive strokes (strokes which move the boat forward) are done using either the *foot pedals* or the *swiveling power handles*.

Maneuvering strokes (stopping, backing up and turning sharply) are done with the hands on the *maneuvering handles* located directly on the oar shafts.

It's important to know how to maneuver, especially how to stop, before you perfect your propulsive skills, so that's the first thing you should learn.

## Maneuvering Strokes

### Stopping

Using the maneuvering handles, turn the oars so the blades are vertical. This is called *squaring the oars*. Square the oars and hold them down in the water. This is called *holding water*. To stop rapidly, hold water with both oars.

### Backing up

Using the maneuvering handles, square both oars and push them down into the water. Then push the oars forward. This is called *back paddling* and will move the boat backward.

### Making sharp turns

For a sharp turn, hold water with the inside oar (inside of the turn) while rowing with a forward propulsive stroke with the outside oar. For an even sharper turn, you can back paddle with the inside oar while rowing forward with the outside oar.

### **Making gradual turns**

For gradual turns while under way (using propulsive strokes) you just take longer strokes on one side and/or use a little more pressure on one side.

## **Propulsive Strokes**

### **Overview**

You can row with your feet (*lower body stroke*) or with your hands (*upper body stroke*) or both together (*full body stroke*). Most people can row comfortably at touring speed using upper or lower body strokes. These two strokes are easy to learn and you should be able to do them well on your first time out. For traveling at higher speeds or to get a higher intensity workout, you can use the full body stroke. The full body stroke may take a little longer to get completely comfortable with. It usually takes some experimenting to get the seat settings just right and some time to learn the muscle movements.



Fig. 14. Lower body stroke (feet only)

### **Lower body stroke (feet only)**

Put your feet on the pedals and your hands in your lap. Move **both feet together** for this stroke. Start out by bending your knees, pulling your feet back toward you as far as you can. Do this slowly and smoothly, allowing time for the oars to swing forward. Don't jerk your feet back so fast that the ropes go slack. When the oars have swung all the way forward, push on the pedals, both feet together. The oars will automatically lower and "catch" the water. Continue pushing the pedals smoothly all the way forward. Push hard enough to keep the oars down in the water. Stop pushing with a little bend in your knees and let them down gently. Don't drop your knees down harshly into the fully extended position. Pause for a moment (1/2 second or so) at the end of the stroke to let the oars lift and clear the water before repeating the stroke. The oars will lift automatically at the end of the stroke.

*(Pull pedals back... push pedals forward... pause... repeat)*

The most common mistake for beginners is to pull your feet back too fast and start pushing forward before the oars have had a chance to swing all the way forward.

### **Upper body stroke (hands only)**

Take your feet off the pedals and place them on the floor to the outside of the pedals. Hold the swiveling handles lightly in your hands (neither lifting them up nor pushing them down). Start out by pushing the handles forward while leaning your body forward away from the backrest. You don't need to lift the oars; they should just clear the water or skim over the top of it. When you have reached your maximum forward position, lower your hands and pull straight back on the

handles. Pull all the way back and lean back in the seat. Pause for a moment (1/2 second or so) at the end of the pull to let the oars lift and clear the water before repeating the stroke.

*(Push handles forward... pull handles back... pause... repeat)*

The most common mistake for beginners is to unconsciously lift the oars high up out of the water on the forward swing of the oars. This is called "skying the oars" and is considered bad form.



Fig. 15. Full body stroke (hands and feet combined)

#### **Full body stroke (hands and feet combined)**

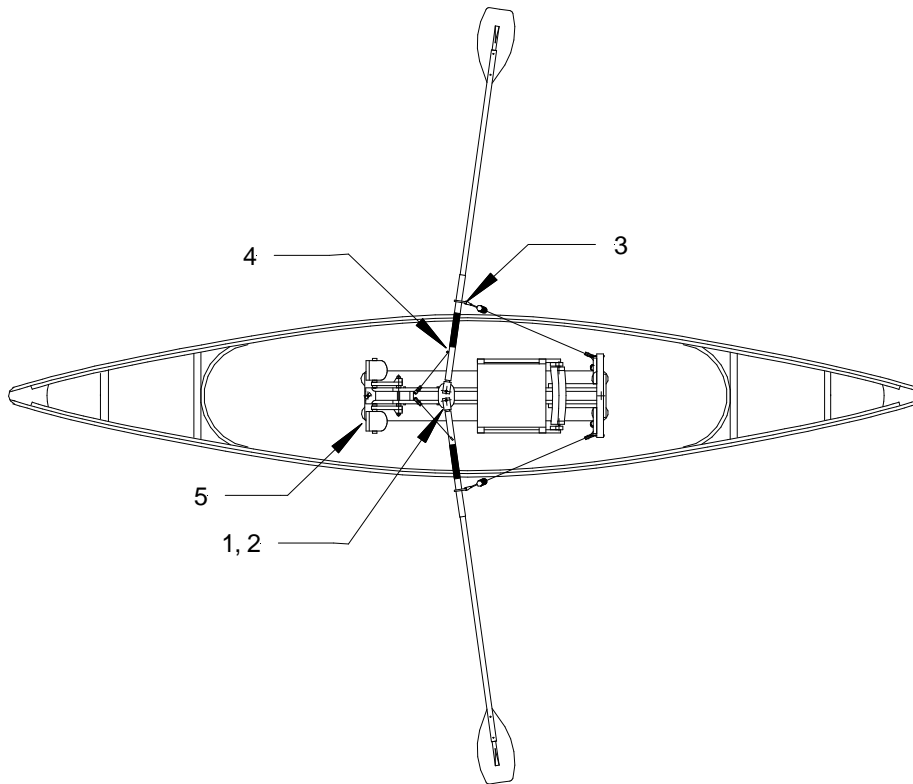
The easiest way to learn this stroke is to start out rowing with just your feet and then follow the motion of the handles with your hands without actually touching them. After doing this for a while, lightly grasp the handles with just your finger tips. As the oars swing forward, lean forward and push the handles ahead a little. This will push your feet farther back toward your body, increasing your stroke length. (If you are not flexible enough to do it this way you can row without leaning forward using a slightly shorter stroke). Pull straight back on the handles as you push the pedals forward with your feet. Lean back as you pull. Pause for a moment (1/2 second or so) at the end of the stroke to let the oars lift and clear the water.

*(Pull pedals back while pushing handles forward... push pedals forward while pulling handles back... pause... repeat)*

The most common mistake for beginners is not leaning forward and pushing the oars ahead during the forward swing of the oars.

# Maintenance

## Lubrication Points



1. Oarlock slides (the part that slides on the black oval).
2. Oarlock slide oil reservoirs (the wicking material located between the slide and the oarlock yoke).
3. Power handle attachment hooks (where they make contact with the collar bushings).
4. The return-spring attachment hooks (where they make contact with the eyebolt on the oar).
5. The pedal axels.

The slides should be lubricated with a little paraffin wax (candle wax) every 20 miles or so, or whenever the sliding action seems sluggish. Rub a little candle wax on the bottom of the slides. At the same time, you should put a few drops of light machine oil (Turbine Lubrication Oil or 3-In-One Oil) on the wicking material above the oarlock slide, just enough to keep the wicking material moist. Wipe off any excess, so it won't get on your hands or clothing.

The other points should be lubricated with paraffin wax every once in a while to prevent squeaking. If squeaking occurs while you are out rowing, you can splash a little seawater on the part, which should quiet it down.

## Return Springs

The return springs (the extension springs which pull the oars forward) enable you to row hands free, and make full body rowing easier. These springs will break after about 500 miles of rowing. They won't lose their power, they will just break. You can still row, but not hands free, you will need to push the oar forward on the return stroke. So it's a good idea to change them every 500 miles or sooner. You can keep a log and make an entry every time you go out, or estimate how many miles you row a year and change them accordingly. One set of spare springs is included with each FrontRower. You can order additional springs from us. You can easily replace the return springs with the rowing unit installed.



## Ropes

Replace the ropes if they get worn or frayed. You can order replacement rope from us or use 3/16-inch diameter double braid polyester rope (Sta-Set brand) available at boating supply stores.



Fig. 16. Adjusting rope length

When replacing the leg power ropes adjust the length by stretching the handles forward so the ropes pull the pedals all the way back (see fig. 16). Adjust length so that the handle snap hooks on the handle line up with the front edge of the forward mount crossbar.

## Checking Oar Depth Setting

The oar depth should be set so the highest part of the oar blade is 2 to 3 inches below water level when the oar is pushed down and in the squared position. With some boats, you may need to raise or lower the blade depth setting. Adjustment is done by holding the nut on the bottom of the vertical oarlock shaft while turning the hex cap on the top. This can be done with the boat in the water. You should make small adjustments (1/4 turn at a time) and adjust both oars equally. If one oar is going deeper than the other, either the boat is listing or one oar is set lower than the other. To check that the depth settings are equal, move the seat forward, push down on the oar tube until it stops and measure the distance from top of beam to top of oar tube (see fig. 17). The factory setting is 12-1/4 inches. Make sure both oars are set to the same depth.



Fig. 17. Checking oar depth settings are equal.

## Checking the blade angle

Swing the oars back over the seat (see fig. 18). Rotate the oars into the “squared” position. The blades should be vertical when squared. When they are vertical, they should be straight up and down and parallel to each other. This should be easy to see with the oars in this position. If either

oar is off more than 2 degrees, adjust by loosening the set screw in the slot near the oarlock, repositioning the set screw, and retightening it.



Fig. 18. Checking the blade angle.

### **Varnish**

Varnish in any outdoor application requires maintenance. Sunlight breaks down varnish, so store your FrontRower covered or in the shade if possible. The top surfaces are particularly vulnerable.

If the varnish becomes dull or starts to break down, clean the area and lightly hand sand with a small piece (2" square) of 220 grit sandpaper. Then apply two or more coats of varnish with a small brush. If stored in the shade, usually a little touch up on an annual basis is all that is necessary. Any marine quality spar varnish can be used.

### **Storage**

The FrontRower should be kept clean and stored covered or under shelter when not in use.

## Specifications

Type: drop-in forward facing rowing system

Overall length: 52"

Operating length: 60"

Height: 24  $\frac{3}{4}$ " to top of oarlock

Width at seat: 16  $\frac{1}{2}$ "

Width at pedals: 15  $\frac{1}{2}$ "

Weight: about 25 pounds with oars

Oar length: 83" pivot to tip

Breakdown oar length: 60  $\frac{1}{2}$ "

Blade surface area: 89 square inches

Oar shaft material: anodized aluminum

Frame material: hardwood (cherry)

Wood finish: exterior spar urethane