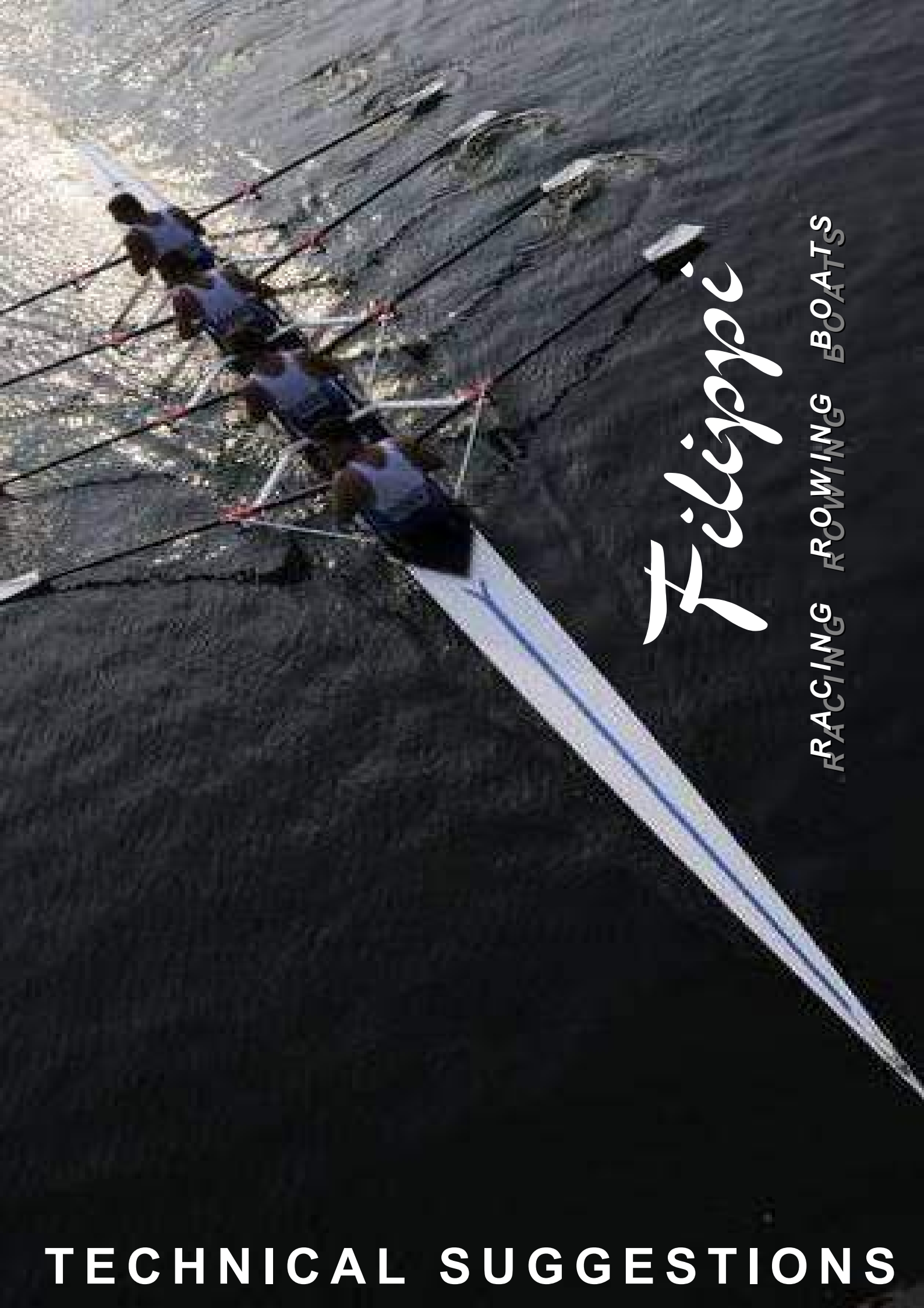

Filippi

RACING ROWING BOATS

TECHNICAL SUGGESTIONS

Filippi
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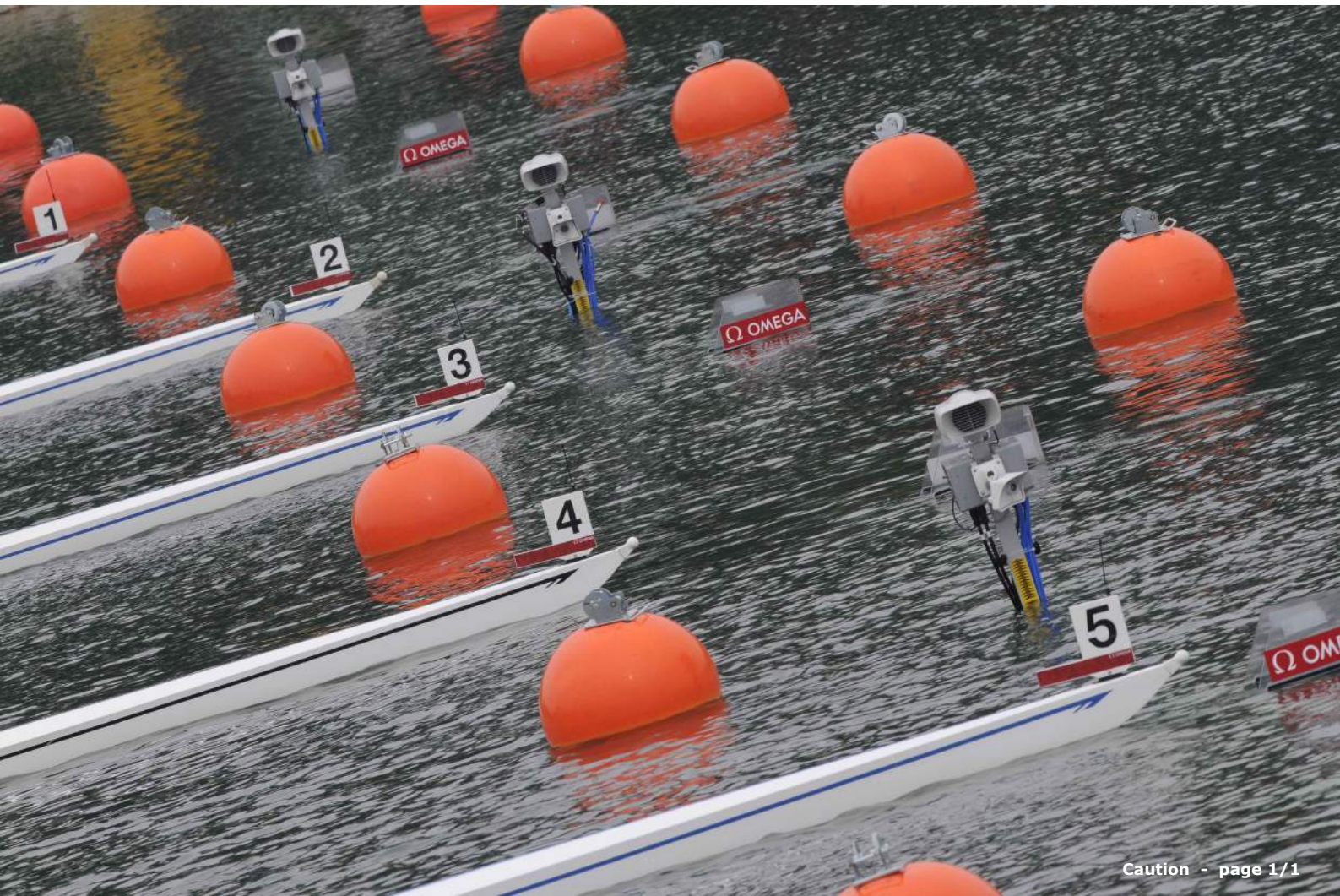
CAUTION:

The information in these pages is aimed at specialized technical staff in the sector and provides information on how Filippi Lido srl carries out the assembly, maintenance and anything else pertaining to the boats built by this company. Non-experts are strongly advised to contact our dealers or professional instructors/coaches.



Filippi
RACING ROWING BOATS

1. Maintenance
2. Boat transport
3. Sectional boat
4. Seat & Rails
5. Adjustable seat
6. Stretcher
7. Fin 1X 2X
8. Fin 2- 4X 4- 8+
9. Setting
10. Height Measure Stick
11. Pitch Meter
12. Standard Aluminium Rigger
13. Backstay
14. Adjustable Backstay
15. Carbon Tube Rigger
16. Aluminium Wing Rigger
17. Carbon Wing Rigger
18. Aliante Carbon Rigger
19. Pitch washers
20. Concept2 bushings
21. Aliante Aluminium Rigger
22. AeRow Fin
23. Multiadjustment-foot Rigger
24. Slat Fin (2-, 4, 8+)
25. Carbon wing rigger 2013
26. Longitudinal washers

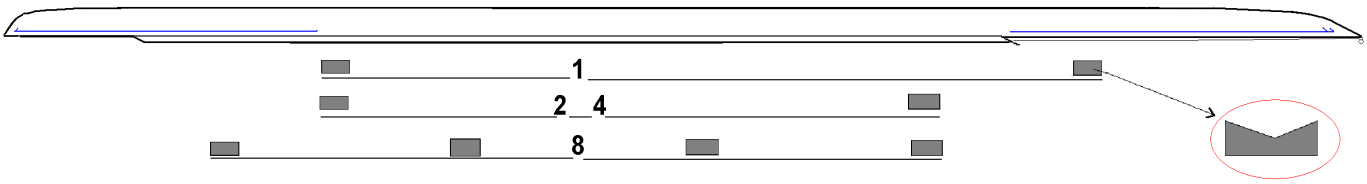
Filippi
RACING ROWING BOATS

MAINTENANCE

Cleaning: After every training session, the boat must be washed to remove all traces of dirt, grease or oil, using a soft cloth dampened with water and soap.
Maintenance should also be performed on the oarlocks, riggers, wheels and sliding parts, rails and footplates according to the technical specifications for each specific item.
After every washing, rinse the outside and inside of the boat thoroughly, also opening the vents in the fore and after peaks to make sure that all condensation has evaporated.

Avoid the use of abrasive cleaners.
Remember to close all peaks before using the boat!

Storage: When stored for inactive periods, place the boat upside down on several suitable supports (see picture), carefully shaped so as follow the line of the cover. Do not keep the protective cover closed for long periods.



Never place it on its side, or near heat sources, or in the presence of solvents or under shelves containing weights that could damage the hull.
Do not cover the boat with plastic sheeting of any kind or dirty cloths and/or materials soaked in oils and grease, but using clean industrial paper or dry and clean cloths. Leave the peaks open.

Warning:
The guarantee is valid only if maintenance procedures are correctly followed!

DISPOSAL

When the boat has reached the end of its life, we strongly advise that it be disposed of respecting the local and national laws in force, and fully respecting the protection of the environment. Thank you.

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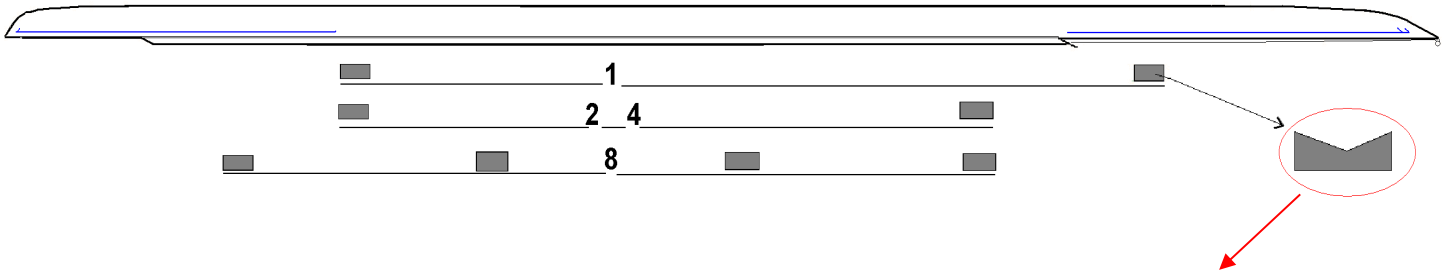
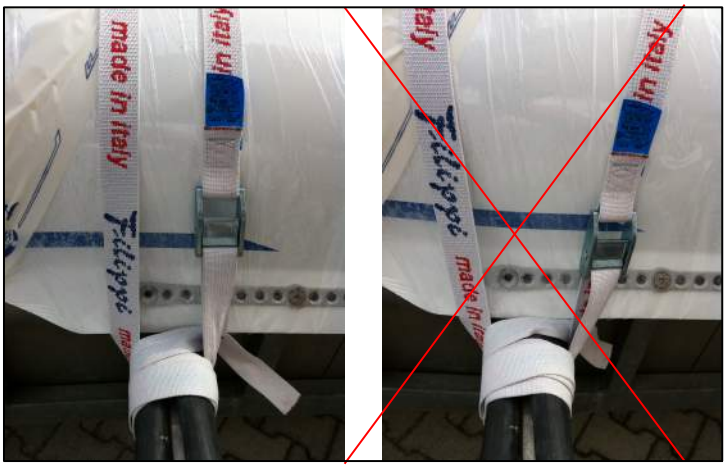
RACING ROWING BOATS

BOAT TRANSPORT

For transporting the boat by hand, the suggestion is to lift the boat at the height of the gunwales, ensuring that all carriers have been properly trained.
For transport on the trailer, the riggers must first be removed, wrapped in bubble wrap or placed in their bags (optional) and loaded properly so as not to be damaged during the trip.
Close all hatches fore and aft bulkheads and secure the sliding seats with straps.
Place the boat gunwales on an adequate number of supports, ensuring that the boat is resting on them properly (if required, use shaped foam supports at least as wide as the boat to rest the decks or covered parts of the peaks).





Correct and incorrect positioning of the straps

Correct shape of the foam supports: note the very limited areas of contact

Fasten the boat to the supports using flat straps with felt lining where they are in contact with the boat. Do not use bungee or elastic cords. Put protective guards between the boat and trailer and between the straps and boat.
Indicate the extra length of the boat as required by the rules of the road.

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RACING ROWING BOATS

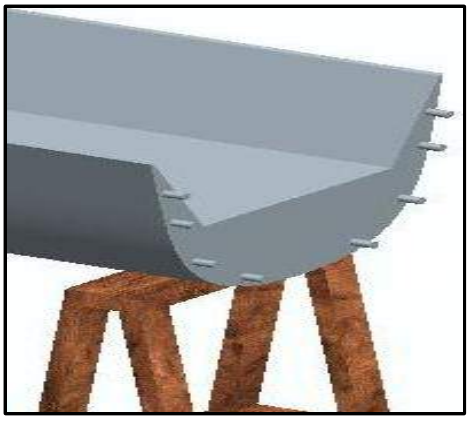
SECTIONAL BOATS

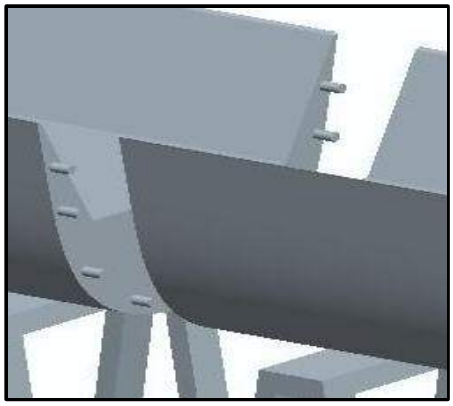
Assembly:

- Place the boat on trestles making sure that hull is well-supported close to the sections to be assembled.
- Check that the boat is correctly aligned and that the bulkheads are facing in the right directions.
- Start by tightening the upper bolts loosely.
- Tighten the bolts of the keel until the surfaces of the bulkheads are sealed.
- Then tighten all the bolts moving in a crosswise direction.
- When finished, check the tightness of the bolts without leaving any imperfectly fitted areas between the two half-shells.

Follow the procedure in reverse to dismantle the boat.

All the boats can be made sectional on request.





Maintenance:

The two components of the boat, when separated, should be maintained by lightly greasing the contact surfaces with a thin layer of melted petroleum jelly or lithium based marine grease.

Warning:
The guarantee is valid only if the maintenance procedure is correctly followed!

Do not unscrew the screws with an Allen key but remove only the nuts.
Do not use the half-shells of the boat individually!

Tools Required:

- 13mm spanner
- no. 5 Allen key

SEATS (SINGLE ACTION / DOUBLE ACTION) AND RAILS

Seats with both single and double-action wheels (standard) can be removed by bringing them all the way to the end of the tracks and forcing lightly by hand where indicated by the arrows, alternating the right side with the left until they come away from the guides.
To mount it, lay the seat on the rails and force it until it slides in.

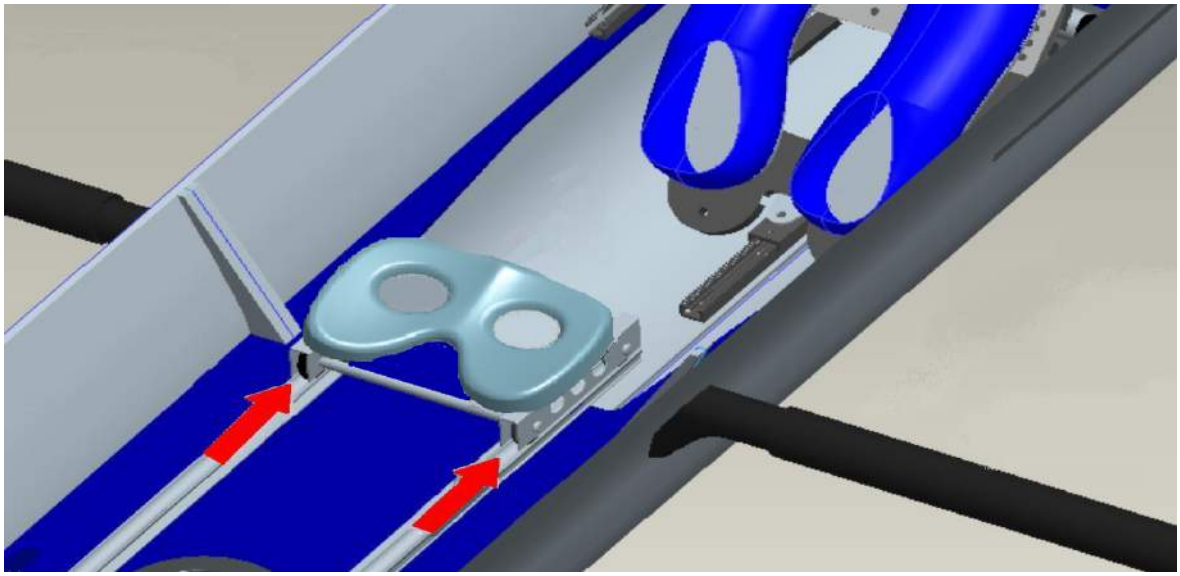


Fig.1 Seat at the end of the guides: to remove, push in the direction of the red arrows.

To make the seat higher you can request an adjustable seat (see technical specifications page) or a seat with a "U" shaped undercarriage higher than the standard 1 cm or 2 cm (see picture).

The methods indicated above are the only methods for increasing height without causing structural weakness or breaking the seat and undercarriage.

Fig.2 Seat with standard undercarriage, raised by 1 cm and 2 cm.

The rails can be adjusted by adjusting the wing nuts (2 for each guide) that are on the underside of the deck; it can be accessed after removing the hatch on the deck.
Check that the wheels of the seat slide to the centre of the guide, otherwise centre the guide.

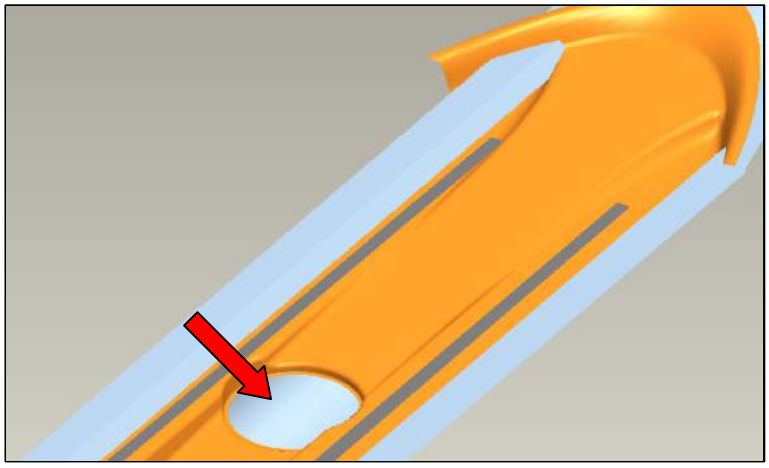


Fig.3 Access to the deck to calibrate the rails.

Maintenance:

Always check the proper anchoring of the guides and the glide action.
Periodically remove the seat and check the state of the wheels (subject to wear) and rails.
Clean and lubricate parts daily using small quantities of mineral oil to remove any foreign matter that may block the motion of the seat and damage the wheels.
Replace all the wheels annually: partial replacement can cause damage to the undercarriage.

When necessary you can replace the seat cover or wheels by requesting them from the dealer.

Never remove the seat from the frame below it!

Warning:
The guarantee is only valid when correct maintenance procedures are followed!

Tools required:

- No. 4 Allen key
- Phillips screwdriver

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RACING ROWING BOATS

SEAT WITH ADJUSTABLE HEIGHT

With this chassis (optional) you can adjust the height (to 7mm, 14mm or 21mm) and the inclination of the seat (0° to 5°).
Figure No. 1 shows the new chassis in the standard position, ie height and angle at zero while Figure No. 3 shows a possible configuration.

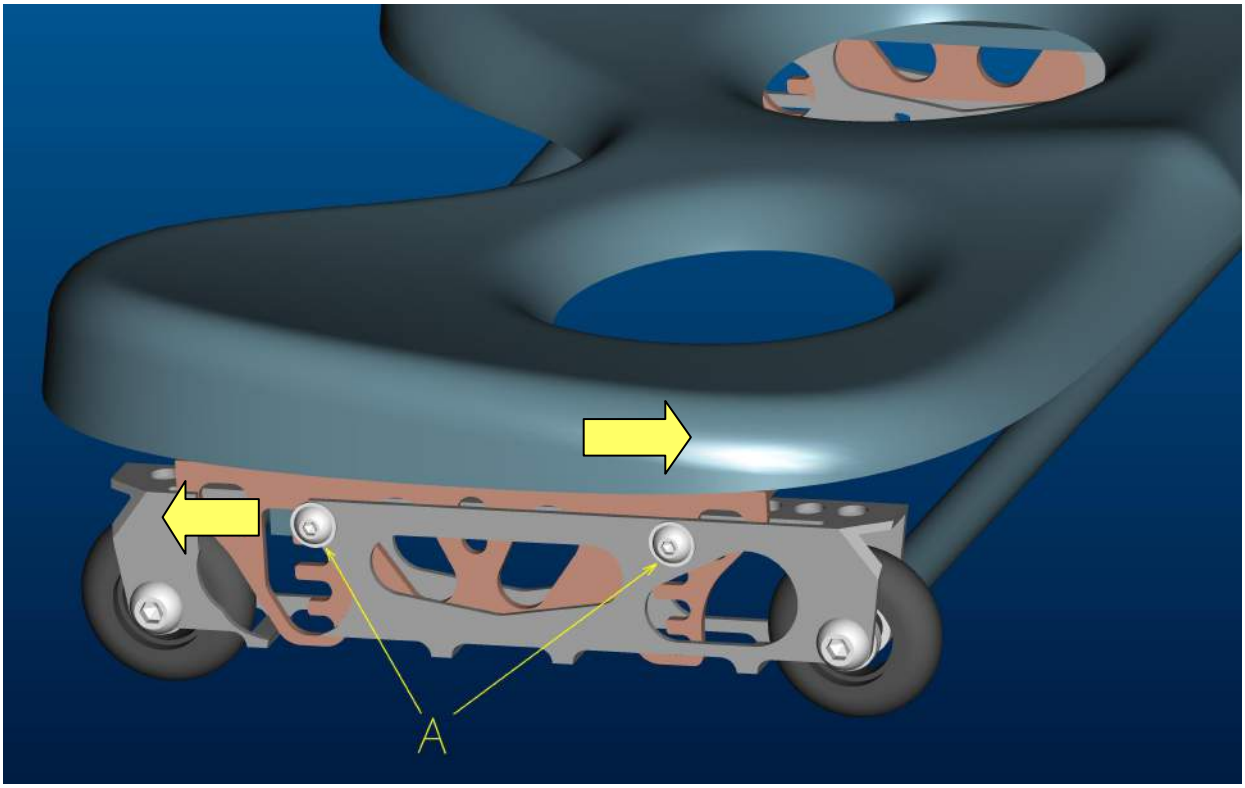

Fig. 1 – Chassis in standard position.

Instructions for adjusting the seat

1. Loosen, without completely unscrewing, the two screws marked with the letter 'A' (See fig. 1) on either side of the chassis

2. Move the seat and the frame in the direction of the yellow arrows until you reach the limit shown in Figure 2

3. Adjust the seat to the desired configuration (see below)

4. Tighten the four 'A' screws as shown in fig. 4

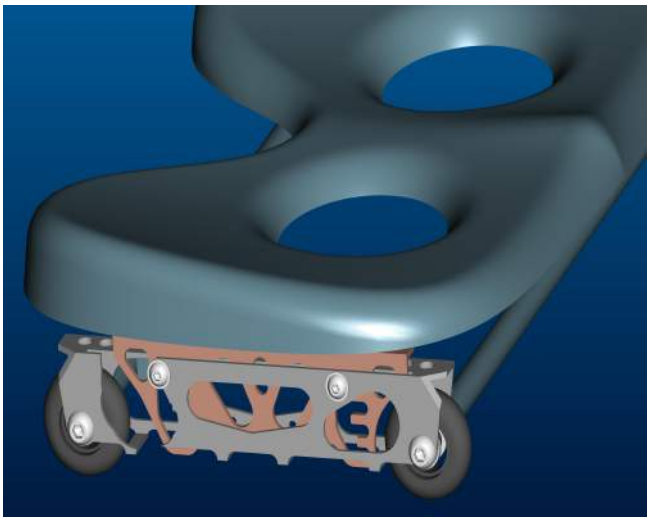

Fig. 2 – End position.

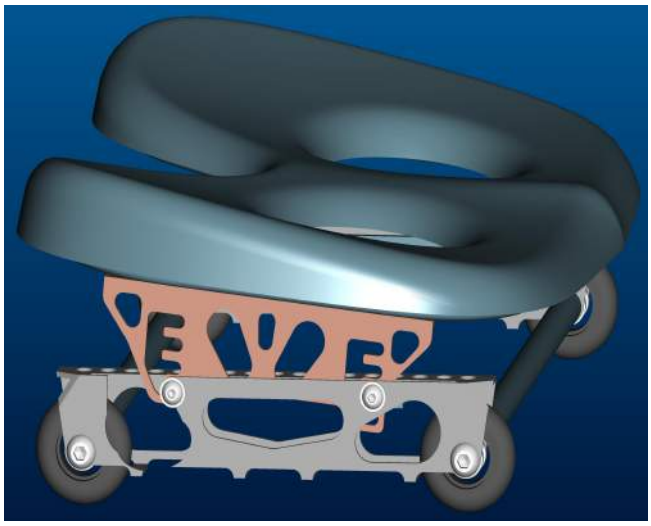

Fig. 3 – Configuration: Height +14 mm. Angle 5 deg.

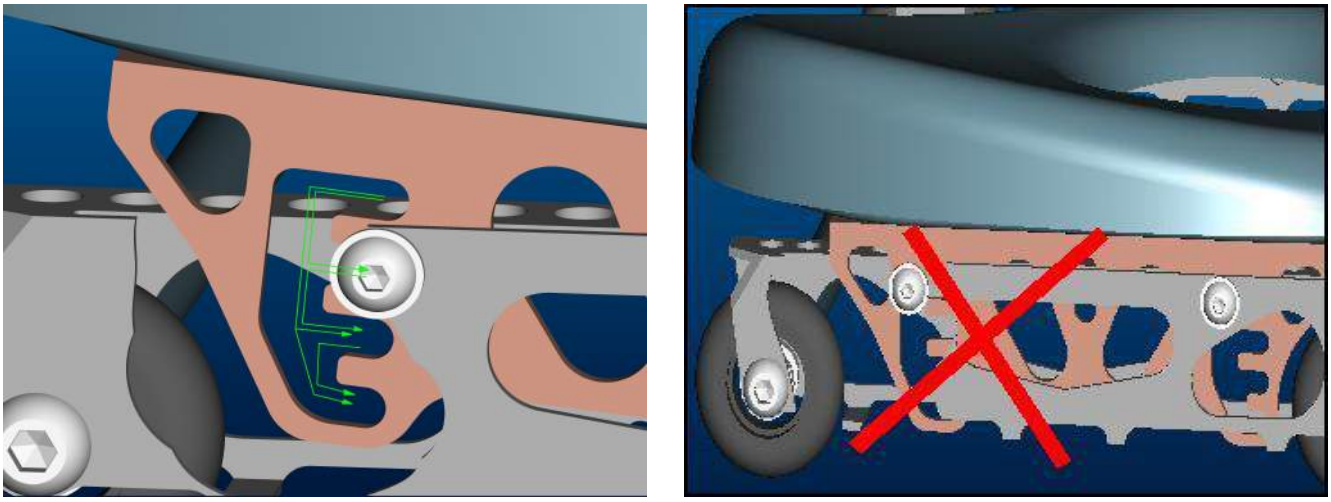

Fig. 4 – Correct (left) and incorrect (right) positions.

Maintenance:

Always check the proper anchoring of the rails and the slide action.
Periodically remove the seat and check the state of the wheels (subject to wear) and rails.
Clean and lubricate parts daily using small quantities of mineral oil to remove any foreign matter that may block the motion of the seat and damage the wheels.
Replace all the wheels annually: partial replacement can cause damage to the undercarriage.
When necessary you can replace the seat cover or wheels by requesting them from the dealer.

Never remove the seat from the frame below it!

Warning:
The guarantee is only valid when correct maintenance procedures are followed!

Tools required:

- No. 4 Allen key
- Phillips screwdriver

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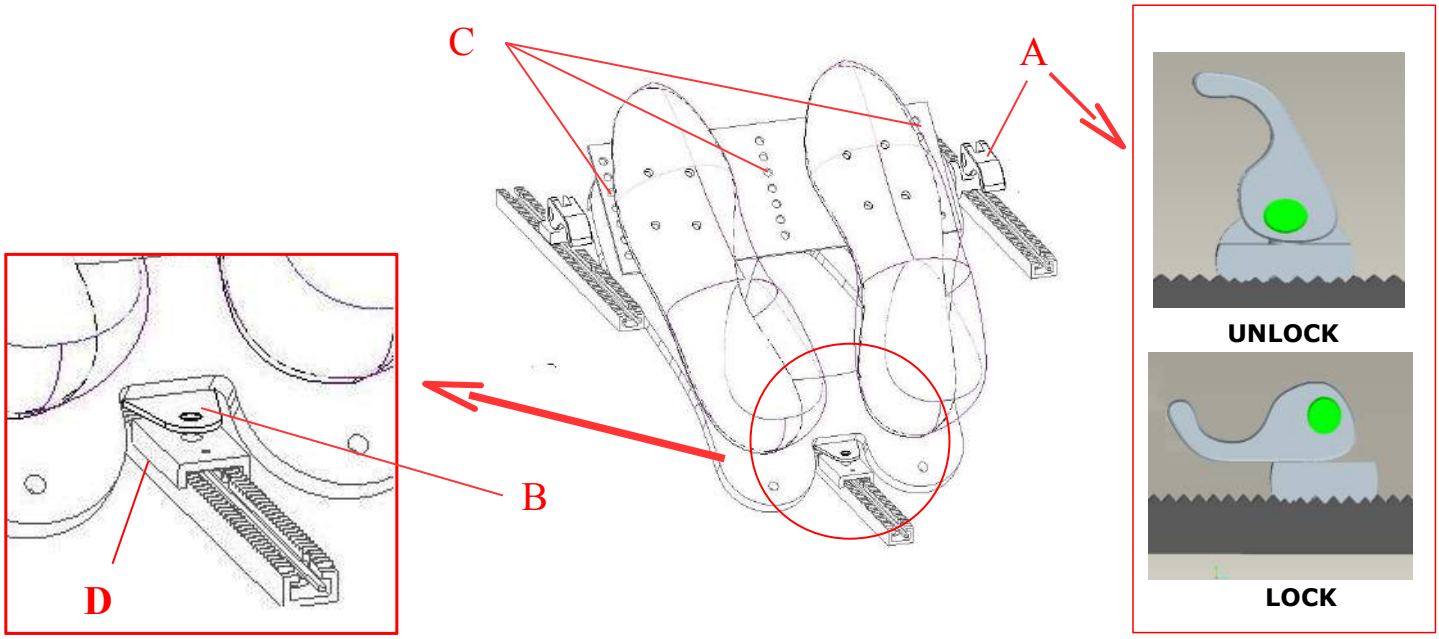
RACING ROWING BOATS

STRETCHER

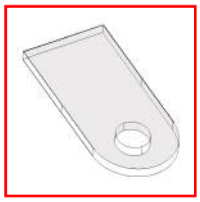
The stretcher can be moved closer to or further from the seat with the two nuts/screws or quick-release couplings (A) at the ends of the cross bar and wing nuts (B).

Before definitively tightening the stretcher make sure it is positioned correctly by checking the equality of the left and right moving parts or in the case of the skiff, counting the free holes on both sides of the boat.

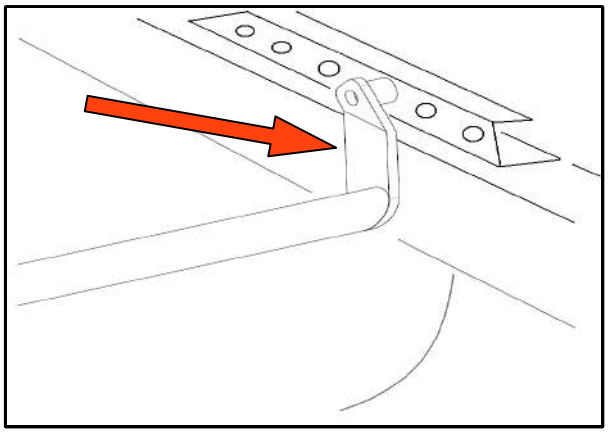
To adjust the height of the stretcher (distance: heel - average height of the seat) it is necessary to adjust the footplate for the shoes, fastened with 3 bolts (10mm) to the stretcher itself (C).



The angle of inclination of the stretcher can only be reduced (up to a maximum of 3 °) by inserting the proper thickness of plastic (pictured right) between the insert D and the Lower Bracket B.

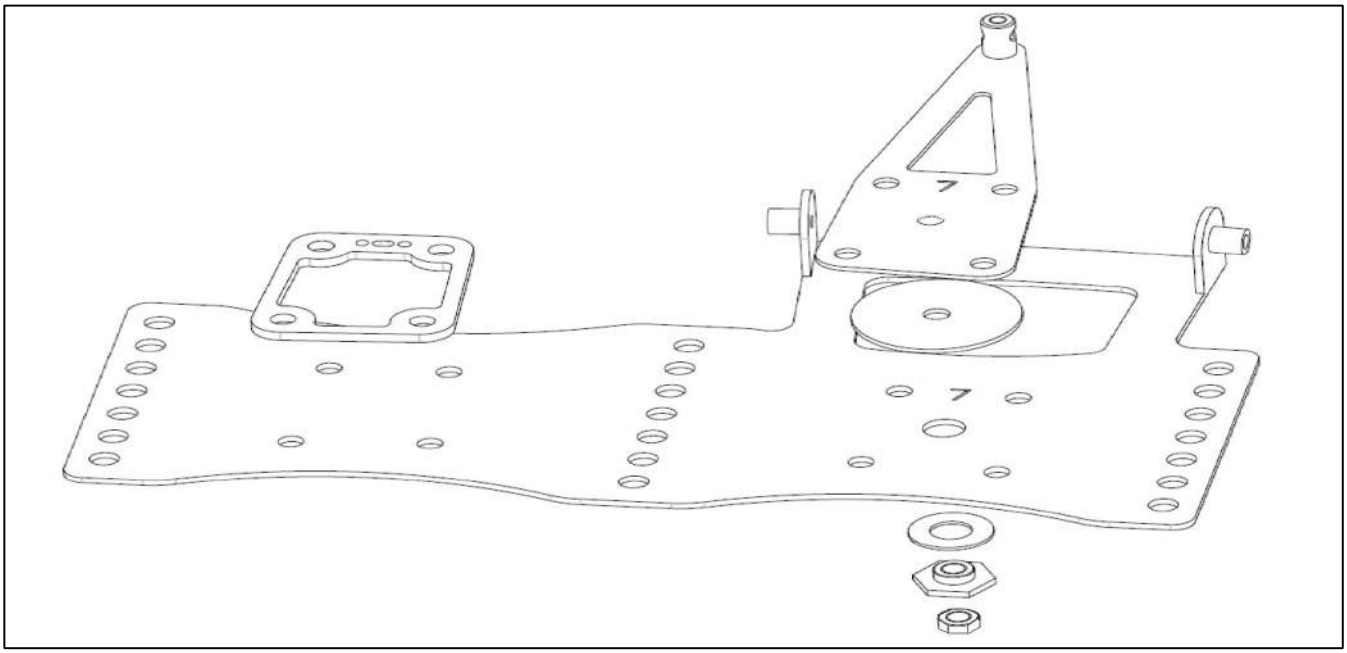


The "elbow" cross bar provided for the skiffs with aluminum and carbon wing riggers can only be mounted with the flange parallel to the gunwale. It is not designed to take different angles and therefore should not be rotated to vary the angle of the stretcher (use the inserts only).

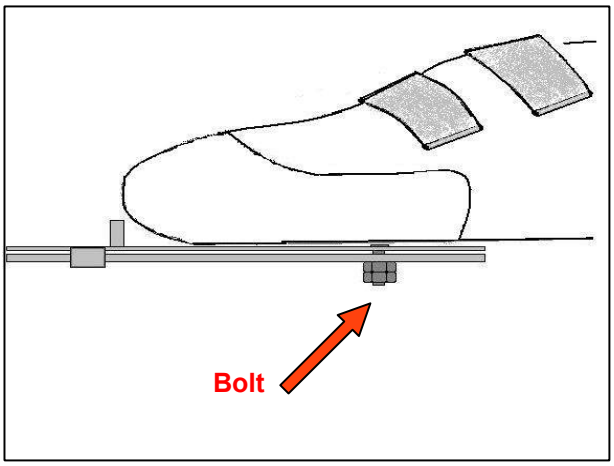


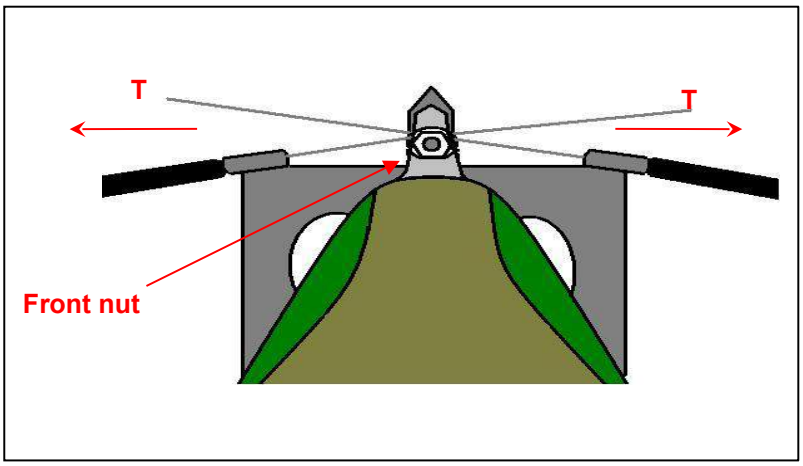
• In the case of the **steering stretcher** (4-,4X, 2-), for more or less smooth rudder control, tighten with more or less force the bolt connecting the two parts of the revolving stretcher itself (10mm).

Since the bolt can become loose with use, its tightness should be frequently checked!

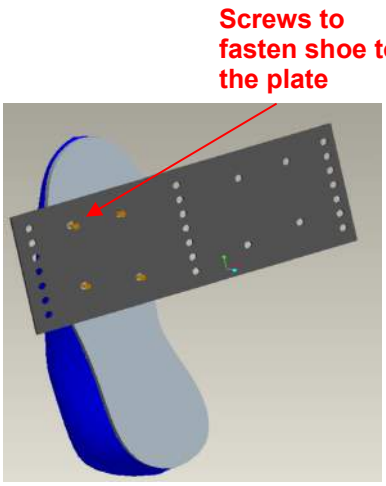


• **To adjust the control cable** it is necessary to put the rudder in line with the fin (zero degrees of inclination) and keep it fastened. Then, after loosening the front screw, working on both the left and right cable, you can adjust the length of the cable. Making sure that the rudder indicator corresponds to the arrow at zero degrees and keeping the control cables tight (direction 'T'), tighten the center srew again (this last operation should be performed by at least two people) .





• **To replace the shoes** you must first remove the plate from the stretcher and then the 4 screws on each side that secure the mounting plate to the shoe itself (whether using the fastened system or the new-wave). With the steering shoe, in addition to the above, you must also remove the center bolt nuts (10mm). For reassembly, in the case of the revolving stretcher, pay special attention to replacing the 4 screws in the upper part of the stretcher itself.



It is strongly recommended that in conjunction with the shoes you also replace the support: the fastening holes for the shoes differ according to model and shoe size.

• To move the steering stretcher from its original location to another you must remove it as per previous instructions, disconnect the cable until it reaches the desired location. Pass the cables through the fastening screws and, after securing the wingnut and cross bar, adjust the control cables as described above, then wind the excess cable in front of the stretcher (it may be useful to secure it with elastic bands in plastic).

The plates, connected with the shoes can be moved, without limitation, to any rowing seat.

Maintenance:

Periodically remove the stretcher, cross bar and shoes and clean components with neutral products.
Grease the threads and reassemble.
Remove the revolving stretcher, clean and lubricate the threads the and the surfaces of the two plates with lithium based marine grease. Check the state of the sheath and steel control cables, grease or replace if necessary.

Warning: The guarantee is only valid when correct maintenance procedures are followed!

Tools required:

- **8mm spanner**
- **2x10mm spanner**
- **no. 5 Allen key (skiff)**
- **Phillips screwdriver**

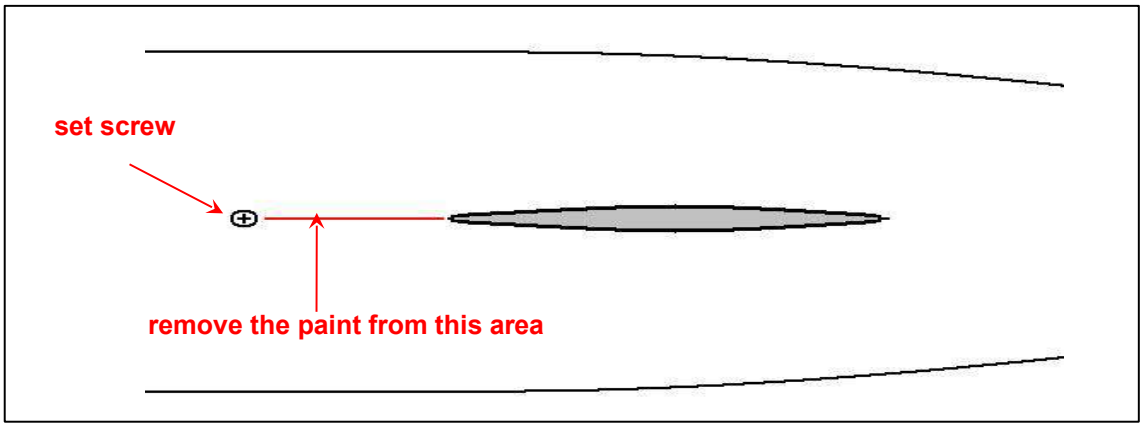
FIN 1X - 2X

Removal

- Place the hull with the keel upwards.

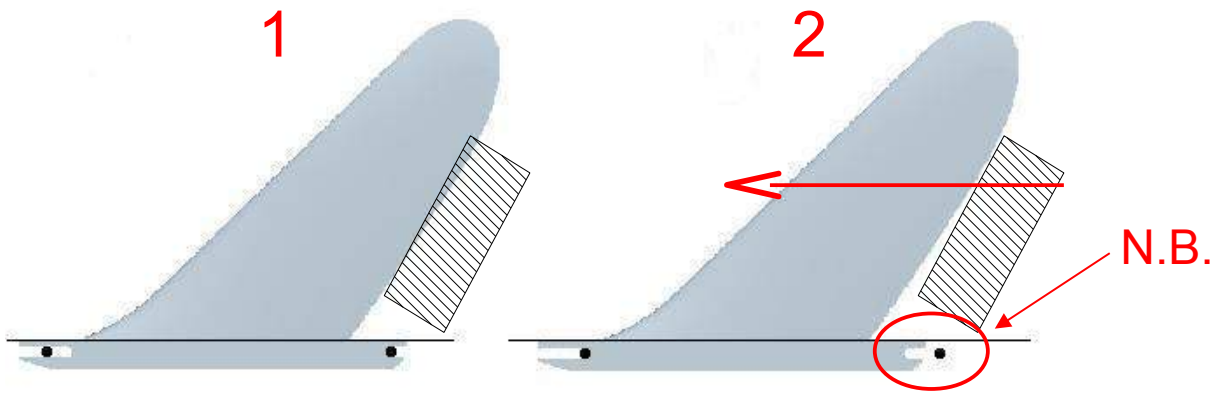
- Remove the set screw placed in front of the fin in the direction of the bow.

- Use a screwdriver to remove the paint from the set screw and the fin



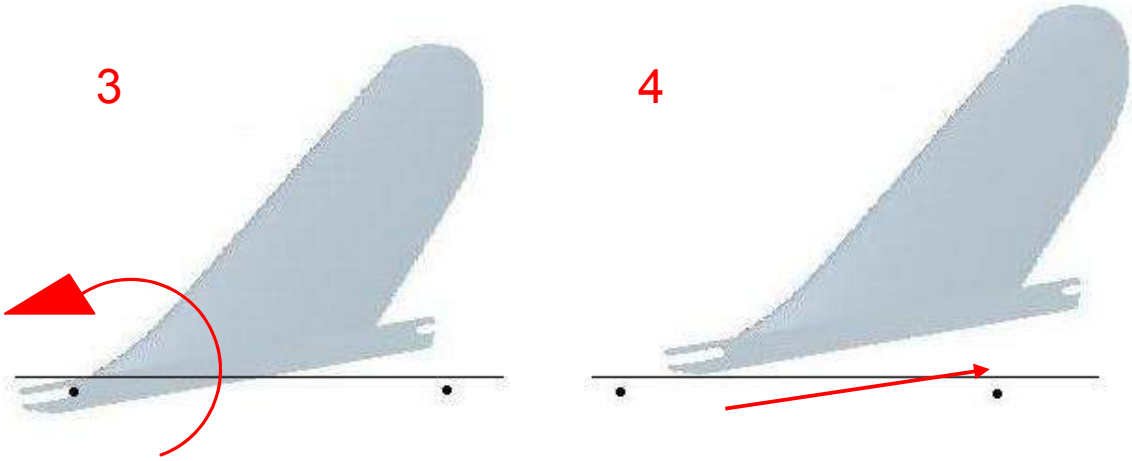
- Keep a block of wood or teflon on the edge of the fin in the area next to the hull (Fig. 1).

- Gently with a hammer on the Teflon, make the fin slide about 1cm fin towards the bow (Fig. 2) freeing the fin from the interlocking fork.



Be sure to use the right amount of force on the fin in the direction of the arrow so as not to damage the interlocking fork.

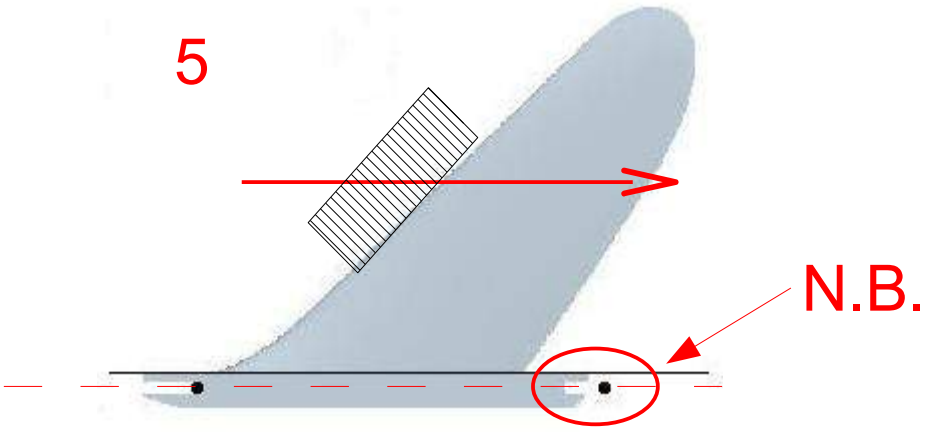
- Then lift the back of the fin only a few degrees (direction 3) and pull it aft (direction 4).



During the removal and assembly of the fin, always carefully support it with a hand in the correct position of insertion or extraction.

Assembly

- Position the boat on two trestles with the keel down.
- Working in reverse order, place the front of the fin in
- The mast step so as to hook it to the pin. The fin must be slightly tilted with respect to the boat so as not to damage the interlocking fork.
- Rotate the fin to complete its insertion into the mast step without pushing it too far into the mast step itself.
- Tap gently with a hammer to attach the back fin fork to the locking pin on the mast step (put Teflon or wood between the edge of the fin and the hammer, as shown in Figure 5).



Make sure that the pin aligns with the rear interlocking slot and use the right amount of force on the fin in the direction of the arrow so as not to damage the rear interlocking fork of the mast step.

Maintenance:

Clean the fin with a neutral product.
Dismantle the fin only if necessary.
In the case of the fin being dismantled, lubricate the screw threads with lithium based marine grease and the surface of the fin that
Is inserted in the mast step. Clean the hull of the boat after reassembly.

Warning: The guarantee is only valid when correct maintenance procedures are followed!

Tools required:

- **Phillips screwdriver**
- **hammer**
- **teflon block**

FIN 2-, 4 , 8+

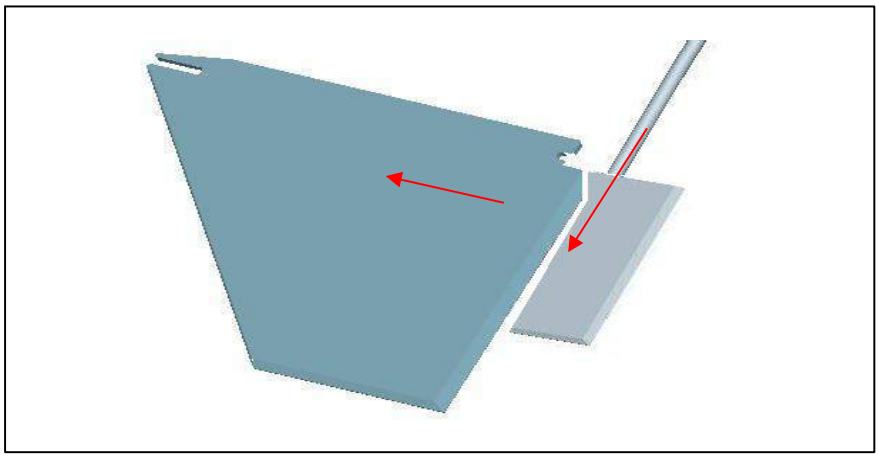
Removal

1. Place the boat on the trestles, and for those boats with the yoke inside the stern bulkhead, open the hatch on the rear deck.

2. Work inside, loosening the nut on the top axis of the rudder (10mm) and remove the control lever.

Warning: The rudder cables form an "X", so be careful not to make the control lever rotate, which could reverse the rotation direction of the rudder or make the control too rigid.

3a. In the case of **an aluminum fin**, remove the rudder by pulling it down after having moved the fin forward a few millimeters.



3b. In the case of **a carbon fin** the operation should be as follows:

- Remove the rudder-lock or, depending on the version, remove the retainer bracket ("omega" shape) of the rudder shaft turning the screws of the seal (see figure 1 or figure 2)
- Remove the rudder shaft by pulling it upward (direction 1)
- Remove the rudder (direction 2)

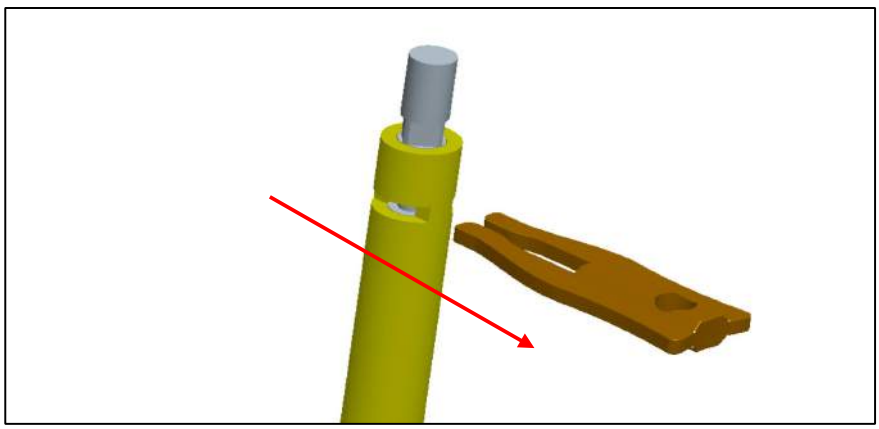


Fig.1 Rudder-lock

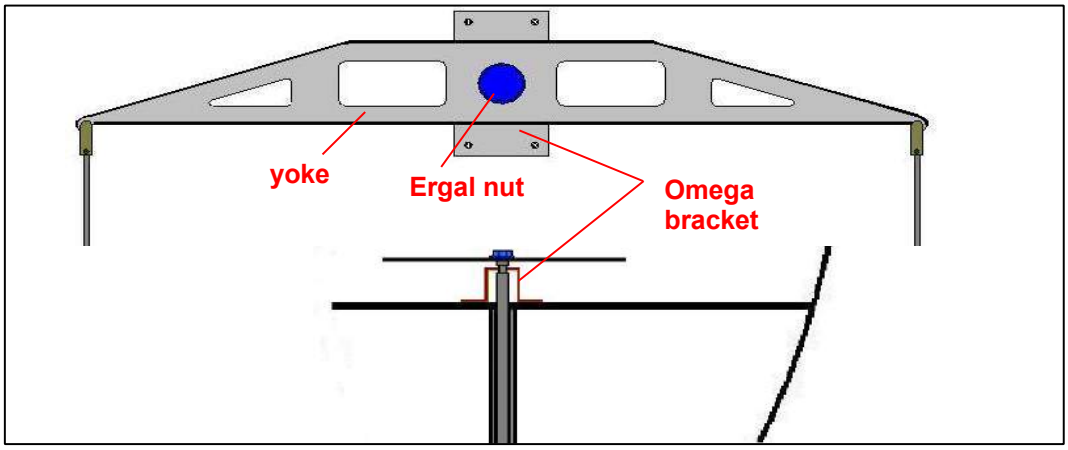


Fig.2 Traditional Mounting

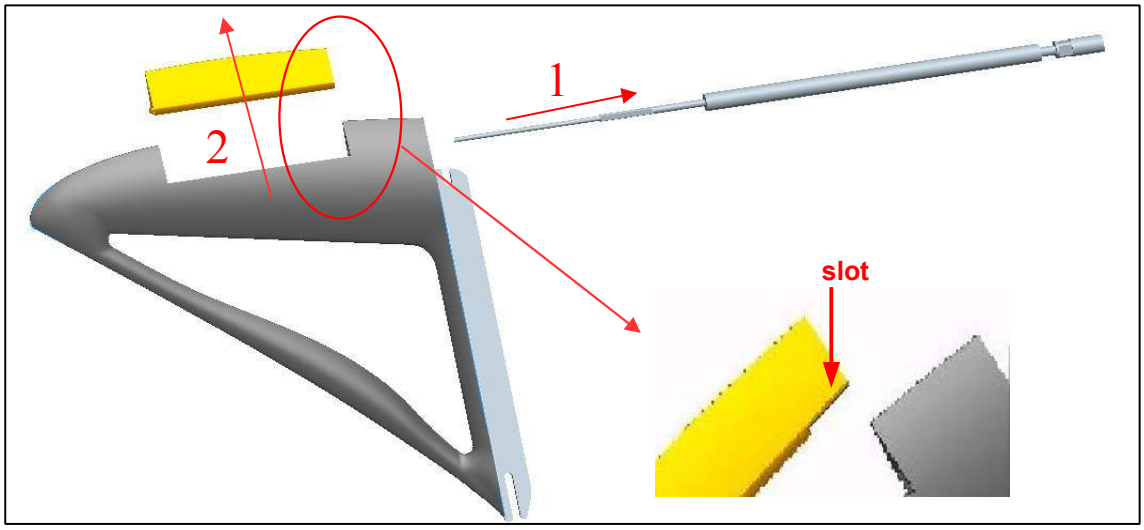
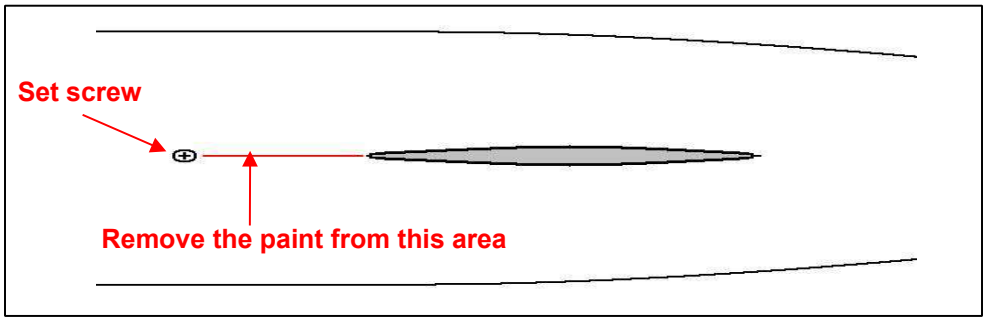


Fig.3 Mounting the rudder with carbon fin

4. Place the hull with the keel upwards

5. Remove the set screw located in front of the fin near the bow

6. Use a screwdriver to remove the paint from the set screw and the fin and the part inserted in the mast step.



7. Keep a block of wood or teflon on the trailing edge of the fin in area next to the hull (figure 4 - drawing 1)

8. Gently with a hammer tap on the Teflon, making the fin slide about 1 cm towards the bow and extract the rudder (Figure 4 - drawing 2)

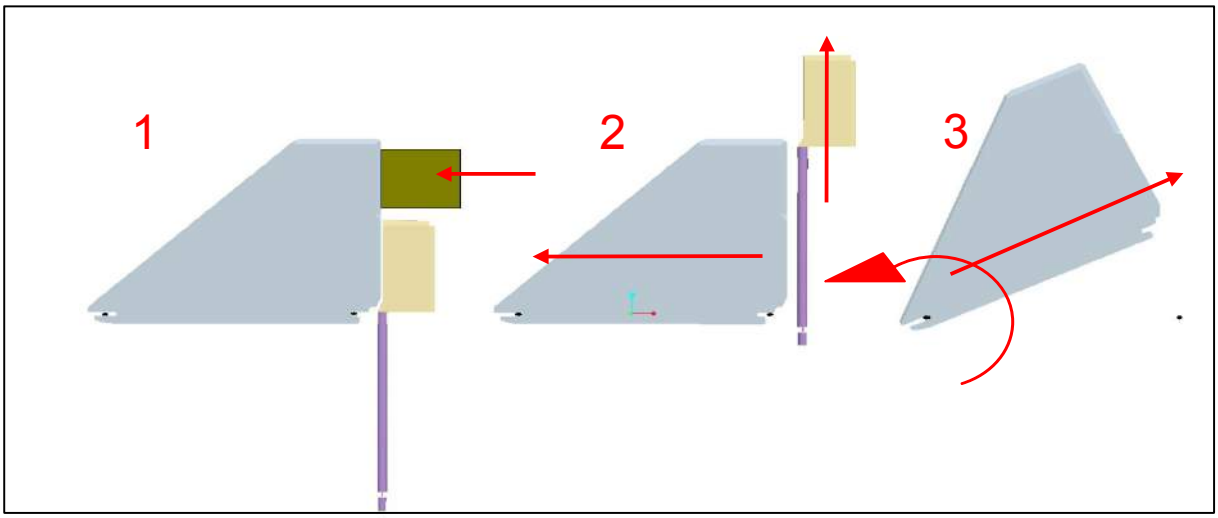


Fig.4 Removal of aluminum fin and rudder

9. Then lift the back of the fin a few degrees and pull aft (figure 4 - drawing 3)

During the removal and assembly of the fin, be careful to support it with a hand in the correct position for insertion and extraction and to use the right amount of force on the fin in the direction of the arrows so as not to damage the interlocking fork of the mast step.

Assembly

1. Place the boat on two trestles with the keel upwards.
2. Reverse the dismantling procedure, placing the front of the fin in the mast step so as to hook it to the pin.

In the case of an aluminum fin:

3a. Insert the rudder from the keel reversing the order of the assembly operations.

4a. Rotate the fin to insert it into the mast step.

5a. Tap gently with a hammer to fasten the rear interlocking fork of the fin to the locking pin on the mast step (always with Teflon or wood between the fin and hammer, as shown in Figure 5).

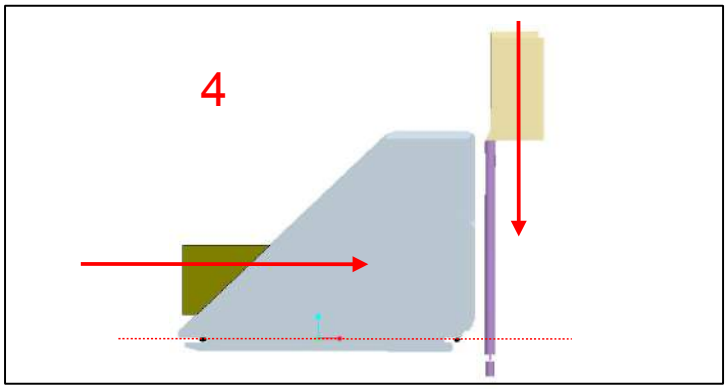


Fig.5 Assembly of aluminum fin and rudder

Make sure that the rear pin aligns with the joint cavity (Dotted line) and on the fin use force precisely in the direction of the arrow so as not to damage the rear interlocking fork for the mast step.

In the case of a carbon fin:

3b. Rotate the fin to insert it into the mast step.

4b. Tap gently with a hammer to attach the rear fork of the fin to the locking pin on the mast step using Teflon or wood between the fin and hammer (see Figure 5 and read the recommendations listed at right).

5b. Turn the boat over with the keel down.

6b. Insert the rudder in the fin slot, making sure to put the slot up (Figure 3 reverse operation to 2), then insert the titanium rudder shaft from above performing small rotations to fit the shaft into the rudder slot.

7b. Mount the rudder-lock in the rudder pin slot or the carbon omega (to be secured with two self-threading screws) and insert the control lever and secure it with the Ergal (aluminium alloy) self-locking nut.

Maintenance:

Clean the fin with a neutral product.
Check the condition of control cables and replace if necessary (See specifications sheet No. 6)
Remove and grease the axis of the pin with lithium-based marine grease if you experience stiffness in the lever.
Remove the fins only if necessary.
In the case where you have removed the fins, lubricate the screw threads and the surface of the fin that is inserted into the mast-step with lithium-based marine grease.
Clean the hull of the boat after reassembly.

Warning!
The guarantee is only valid when correct maintenance procedures are followed!

Tools required:

- **No. 10 Allen key**
- **Phillips screwdriver**
- **Hammer**
- **Teflon block**

SPAN/SPREAD (L)

In the case of sculling, span is the distance between the oarlocks, while for sweep it is the distance between the oarlock and the centre of the boat.
To take measurements, for sweep we need to find the distance between the oarlock and the semi-distance of the gunwales calculated on the interior of the boat, for the scull we need to perform this measurement, both to right and left to be certain of the symmetry with respect to the center of the boat (see Figure 1).

In the technical specifications for each rigger, there are instructions for their calibration.

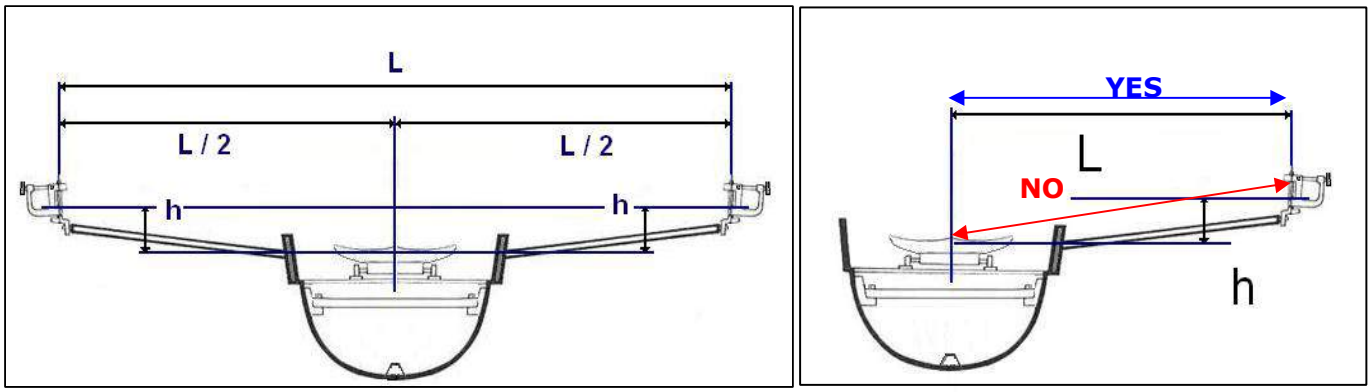


Fig.1 Rigger span/spread for scull and sweep; note the two equal semi-apertures (L/2) for sculling and a common error in taking measurements (in red)

HEIGHT (h)

It is defined as the vertical distance between the sliding seat (mid point) and the oarlock. To measure this you should use the appropriate "measuring stick" (see technical specifications sheet).
For height adjustment, follow the specific instructions for each rigger.

The rims of the gunwale (as opposed to the sill) do not provide a reliable plane of reference, therefore, measuring the height by placing a rigid stick on the gunwale and calculating the sum of the 'stick and seat' and 'stick and oarlock' distances is incorrect because a small error in the angle becomes a large error in the vertical measurement!

The boat should only be equipped with the riggers and oarlocks made specifically for that boat

ZERO LINE TO OARLOCK DISTANCE

The zero line is identified in the boat with wing and Aliante riggers on the gunwale by a thin white line, while in the boat with straight riggers (transversal) it is located in correspondence to the aft side of the rigger situated at the center of each rowing seat (see Figure 2).
The oarlock should be rotated aft and should be measured from the face indicated in Figure 3.

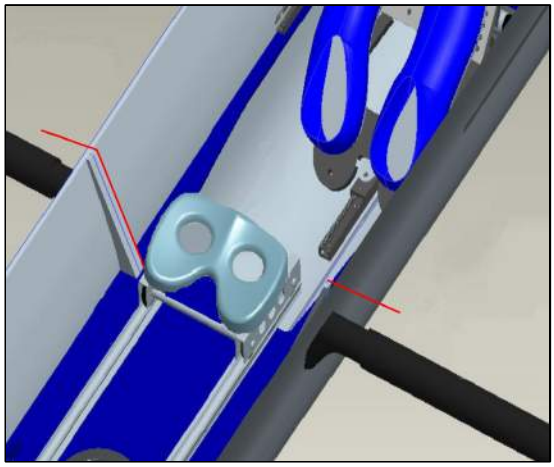


Fig.2 Zero line in ITA S boat

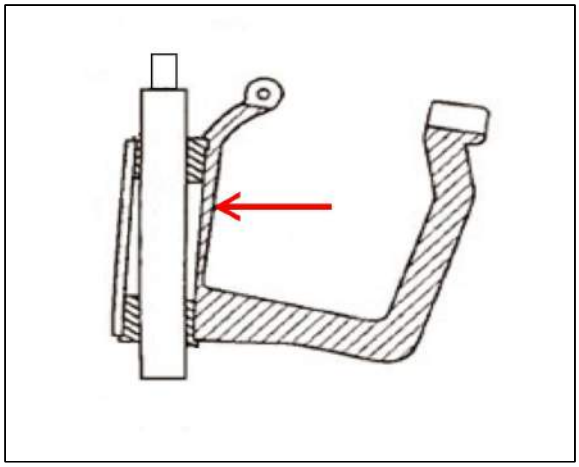


Fig. 3 Face of oarlock from which to measure

To take this measurement for sculling we recommend inserting a rectangular structure inside the two oarlocks (after rotating them aft) moving it to the side indicated in Figure 3; the distance should of course be measured at right angles to the stick See fig. 4).
In the sweep, after rotating the oarlock aft, we must align the stick to the seat line and measure as previously.

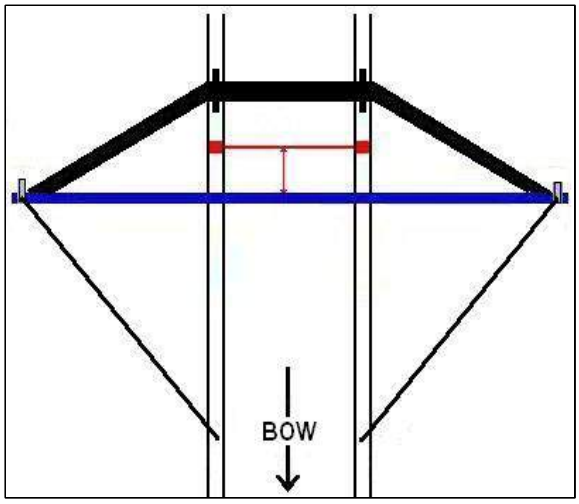


Fig 4 Example of measurement in the sculling boat

The riggers are produced, usually with the oarlock aligned with the seat line.
For all riggers with the exception of the standard aluminum, you can change the distance from the seat line with the methods outlined in the explanations of each rigger.

MEASURING STICK

This tool is necessary for measuring the height of the oarlocks.

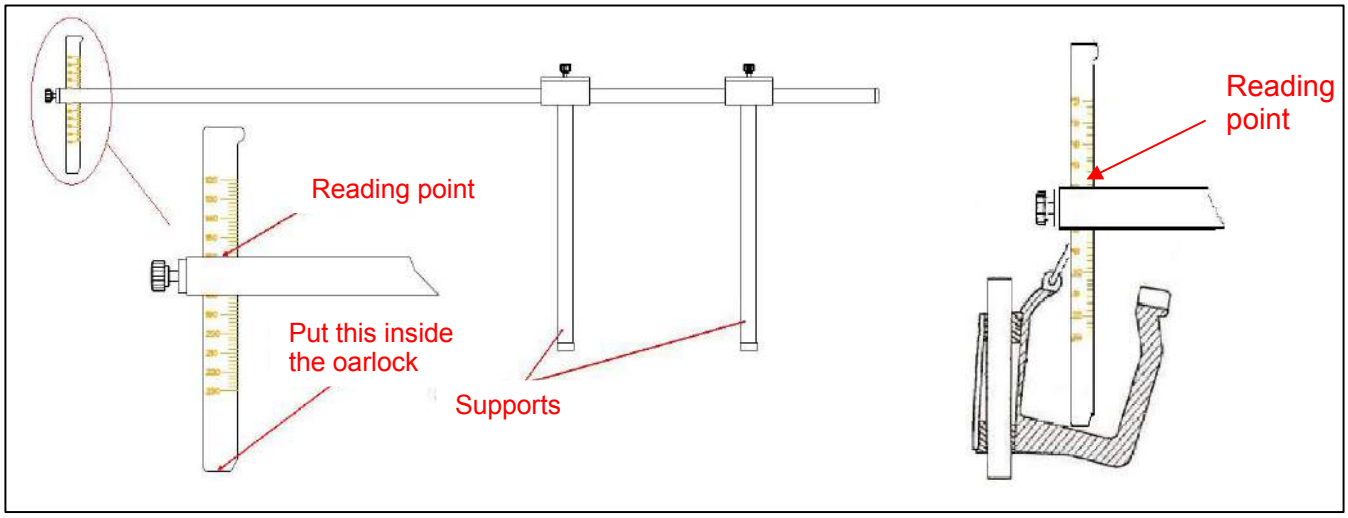


Fig. 1 - Tool with deck supports

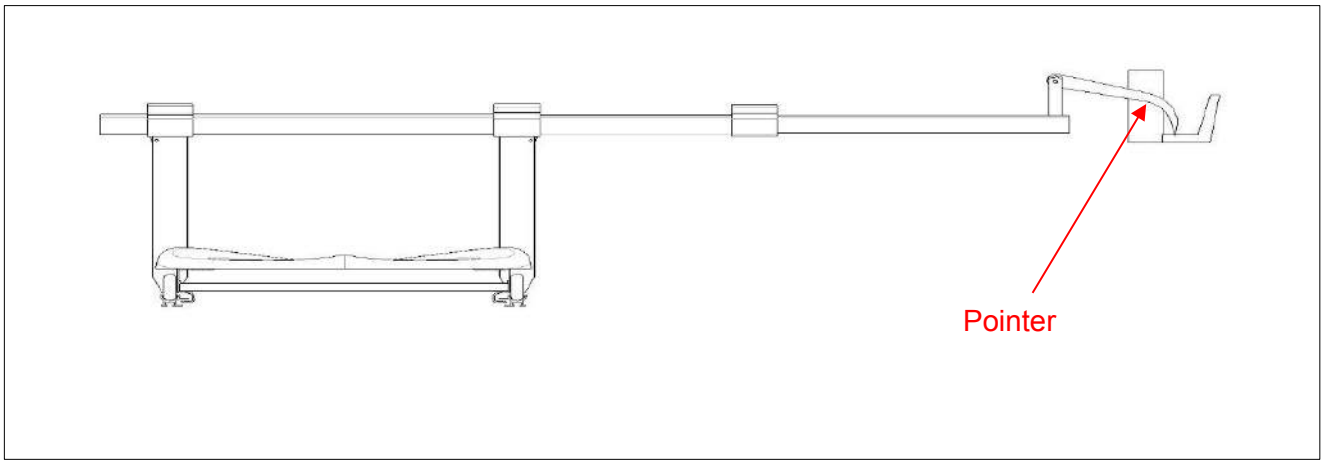


Fig. 2 - Tool with rails supports

How it is used:

- For correct measurement, rest the supports of the stick on the deck at the seat line or on the rails (depending on model).

- Extend the rigger and adjust the pointer touching the inside of the oarlock (around the middle) with the base of the measuring stick.

- The height is the value read in the "reading point" shown in the figure.

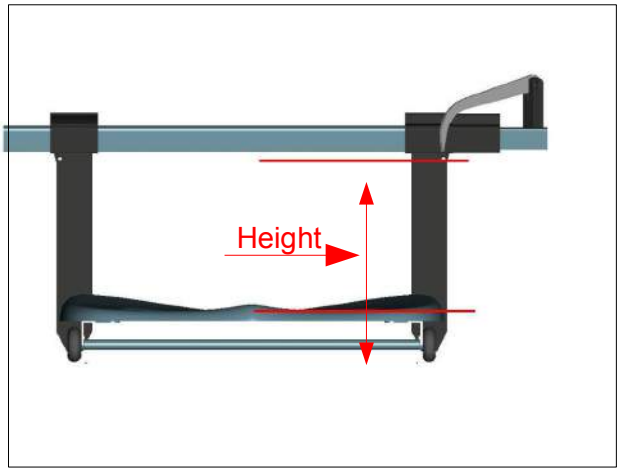


Fig. 3 – Height measured with the tool for the rails

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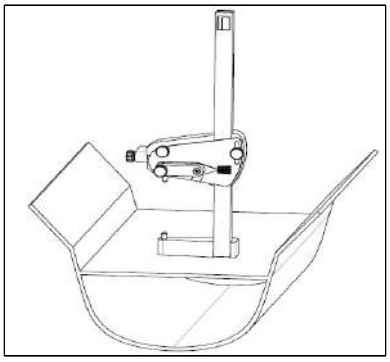
PITCH-METER

This tool is necessary tool for measuring the inclination angle of the oarlock pin.

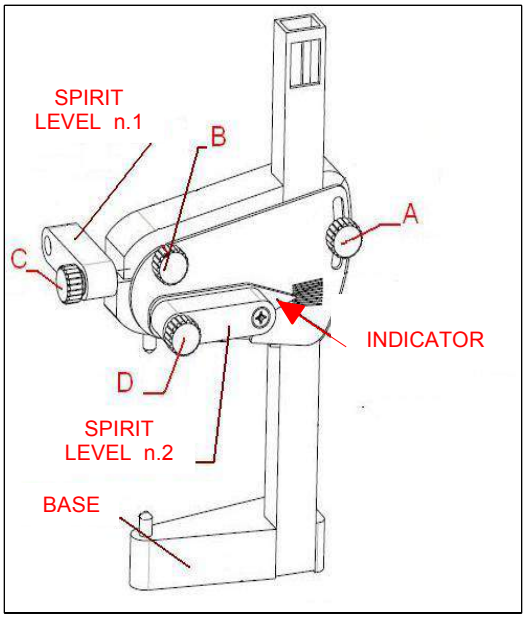
Instructions:
To adjust and check the angle of the pin you must first define zero on the instrument, then set the desired angle for the pin.



Define zero on the instrument with the following steps:

- Put the boat on support trestles and make sure it is level both longitudinally and transversally.

- Set the pitch-meter position on the deck transversally to the boat, as shown in Figure to the right (if the deck is not even put a bar at right angles to the boat to be used as support for the pitch-meter).



- Use knob 'C' to even out spirit level '1 '.

- Loosen knob 'D' and put the angle indicator to zero.

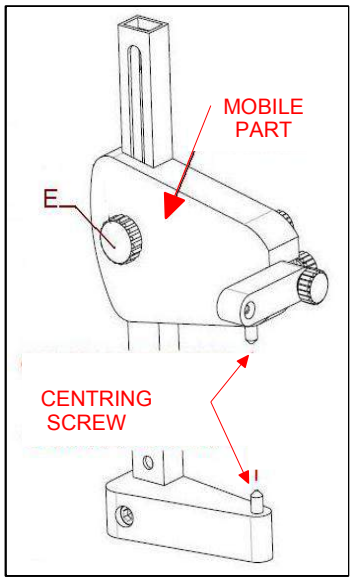
- Tighten 'D'.

- Loosen 'A'.

- Bring the bubble to level '2 '(if necessary to loosen knob 'B' as well).

- Tighten knob 'A'.

Set the desired inclination angle of the pin with the following steps:



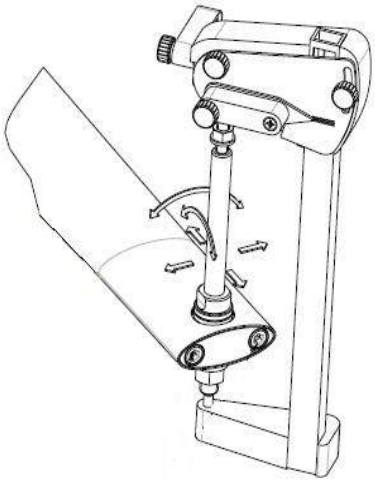
- Using only the knob 'D', set the inclination angle of the pin only if different from zero (remember that the positive lateral angles are those marked above zero).

- Set the pitch-meter without changing the oarlock orientation (spirit level 2 transversal, spirit level 1 longitudinal) and adjusting knob 'E', tighten the pin between the two centring screws.

- Tapping on the pin to change the angle in small steps bring the bubble level. Be very careful not to rotate the instrument while making adjustments.

- Make sure that the level 'A', the index of the longitudinal inclination of the pin is also level.

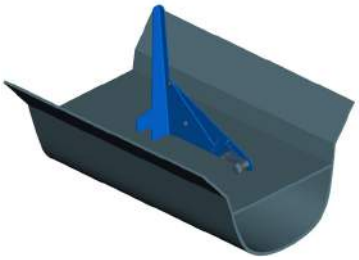
In the case of carbon Wing rigger and Monotube Carbon rigger, working with a very loose pin makes it extremely difficult to find the correct setting: it is best to loosen the holding screws or bolts only slightly and rotate them with small taps until the desired angle is reached.

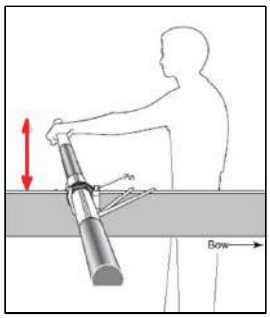


PITCH GUAGE ADJUSTMENT

Instructions:

- Put the boat on support trestles and make sure it is level both longitudinally and transversely. If the boat is fitted with inclined decks use the gunwales as a reference.



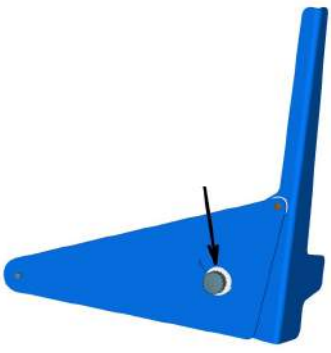


- Place the Pitch Guage on the deck (or on the gunwale) with the pitch guage at zero.

- Loosen knob 1 and bring the bubble to level.

- Place the oar at the passage point and we want to measure the angle of the blade (eg: STARTING POINT, MID POINT, FINISH).

Be sure there is contact between the sleeve of the oar and oarlock then simulate the blade in the water, taking into account the depth.



- Place the Pitch Guage at 7 cm from the end of the oar blade.

- Loosen the knob 2 and bring it to level without loosening the knob 1.

- The value indicated is the angle of inclination of the blade during the stage analyzed (START, MID POINT, FINISH).

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STANDARD RIGGER 3-4 ALUMINIUM TUBES

The 3-rigger tube is used for the double scull since the load is shared between the two riggers. For sweep the 4 tube rigger is preferred.
From the point of view of mounting and adjustment, the two systems are identical.

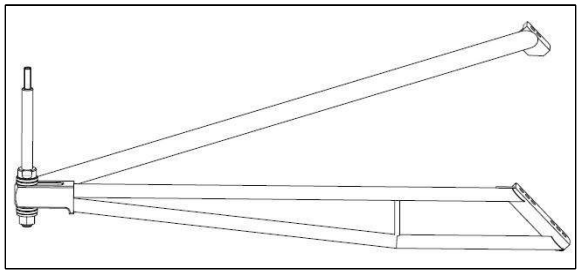


Fig. 1 three tubes aluminum rigger

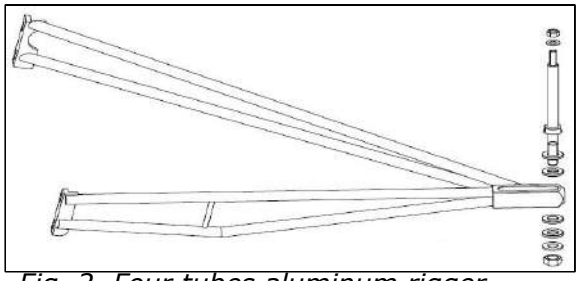
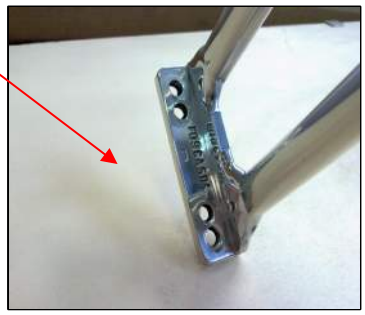
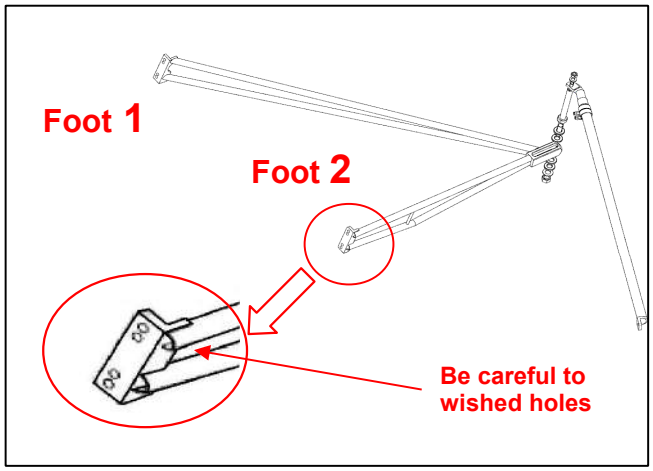


Fig. 2 Four tubes aluminum rigger

NOTE:
All riggers are provided with rowing seat identification and serial numbers





Assembly

1. Remove the nuts from the support screws attached to the boat. Keep in mind that these screws must never be removed unless there is damage.

2. Position the rigger by inserting foot '1' of the joining tube in set screw and turn the nut without tightening it, to keep it from slipping out.

Where the rigger holes and screws do not correspondence, make sure you have positioned the rigger correctly and that the screws have not been bent during shipping.

3. Join foot '2 ', making sure to use the same holes as foot '1' (The plate has 2 holes for all boats, 3 in the case of the single); Insert the nuts and after ensuring proper contact between the riggers and hull, tighten the M6 nuts of both support feet (4 in the case of sweep, 3 for the double scull).

4. Adjust the pin.

5. Mount the fifth tube.

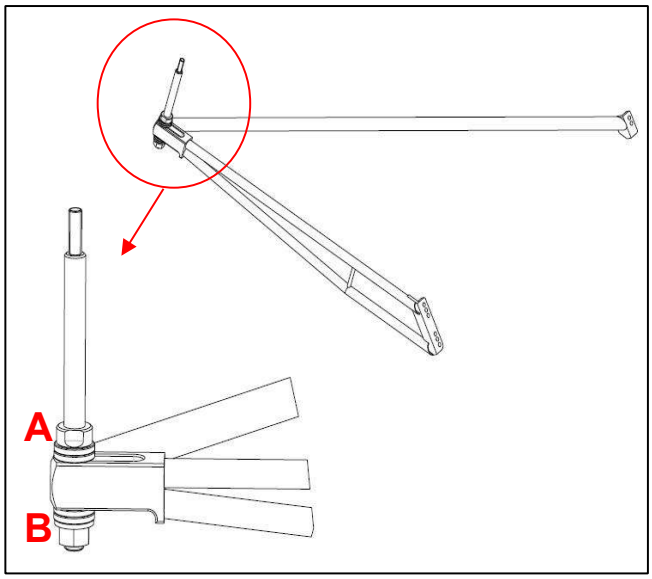
Calibrations

- Adjust the aperture with the help of two 19mm spanners: hold the pin still with nut 'A' and loosen 'B'.

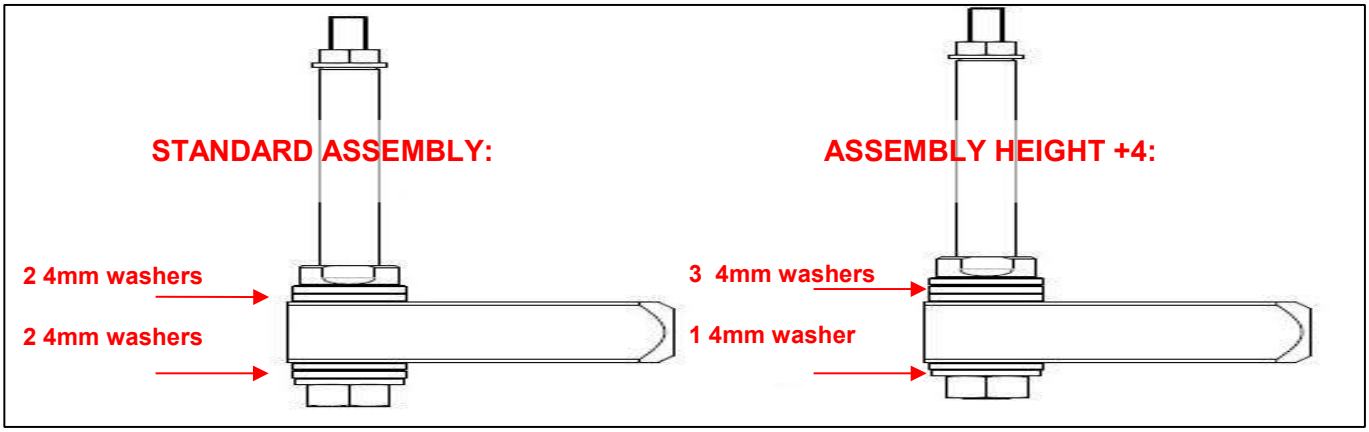
  Broadening the oarlock(s) up to the desired aperture.

  In the case of sculling check that the semi-apertures are equal.

  Tighten the pin definitively.



- The height can be adjusted by turning the 2mm PVC washers and the 4mm aluminum washers as shown:



For correct measurement of spread/span and height see technical specifications page (No. 9)

- It is possible to vary the lateral angle by inserting the appropriate washers (see Technical specifications sheet n.11).

To change the position of the supports, do not force the rigger by inserting a tube in the pin or in any other way than with the aid of washers.

- The rigger is constructed with the oarlock-seat line distance requested; you can not change it later.

Maintenance

It is important, to ensure maximum efficiency of the rigger, to maintain these boat parts before any storage and during use.

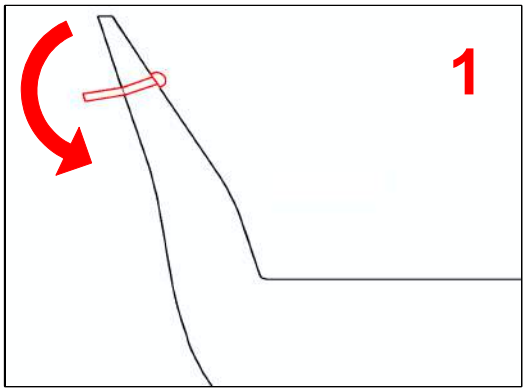
Remove the riggers by removing the nuts connecting to the boat.
Remove the fifth tube and maintaining according to technical specification sheet No. 13.
Remove the pin.
Remove the oarlock and washers from the pin.
Clean all components with neutral degreaser.
If necessary remove salt and calcium deposits or residue using a calcium removal product.
Lightly grease sides with melted petroleum jelly or lithium marine grease.
Reassemble the parts.

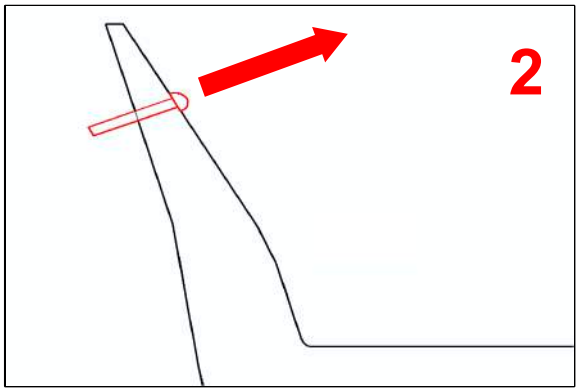
This maintenance should be performed monthly.

Warning: The guarantee is valid only if correct maintenance procedures are performed!

Repair

If it is necessary to replace the retaining screw, you must first straighten it and then unscrew it as shown in the image below.





Tools Required:

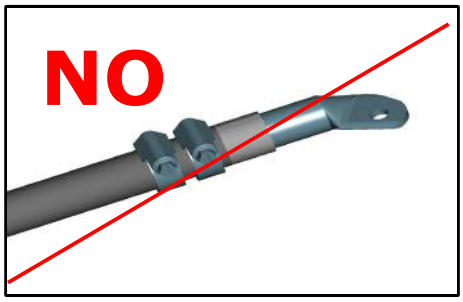
- 10mm spanner
- 17mm spanner
- 19mm spanner
- Measuring tape
- Oar Adjuster
- Height measuring stick
- backstay tools

BACKSTAY

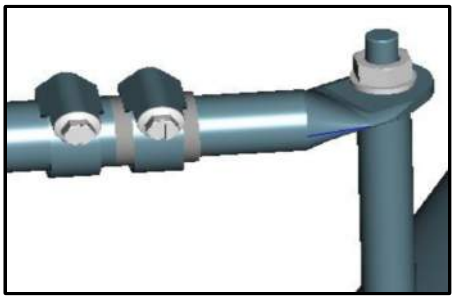
The backstay is a support that must **be mounted strictly on** the tubular aluminum rigger, the aluminum wing rigger, and the carbon rigger.

Assembly

- Remove the upper nut (M8) and the washer on the pin.
- Tighten the second nut (M8) until the desired resistance for the rotation of the oarlock is reached.
- After having fastened the rigger to the boat, attach the beak to the end of the oarlock positioning it on the nut.
- Loosen the two hose clamps.
- Fasten, without tightening, the opposite end of the tube to the boat.
- Tighten the threaded ferrule until it touches the tube; hold it to the tube with a hose clamp and fasten the other hose clamp as shown in figure.

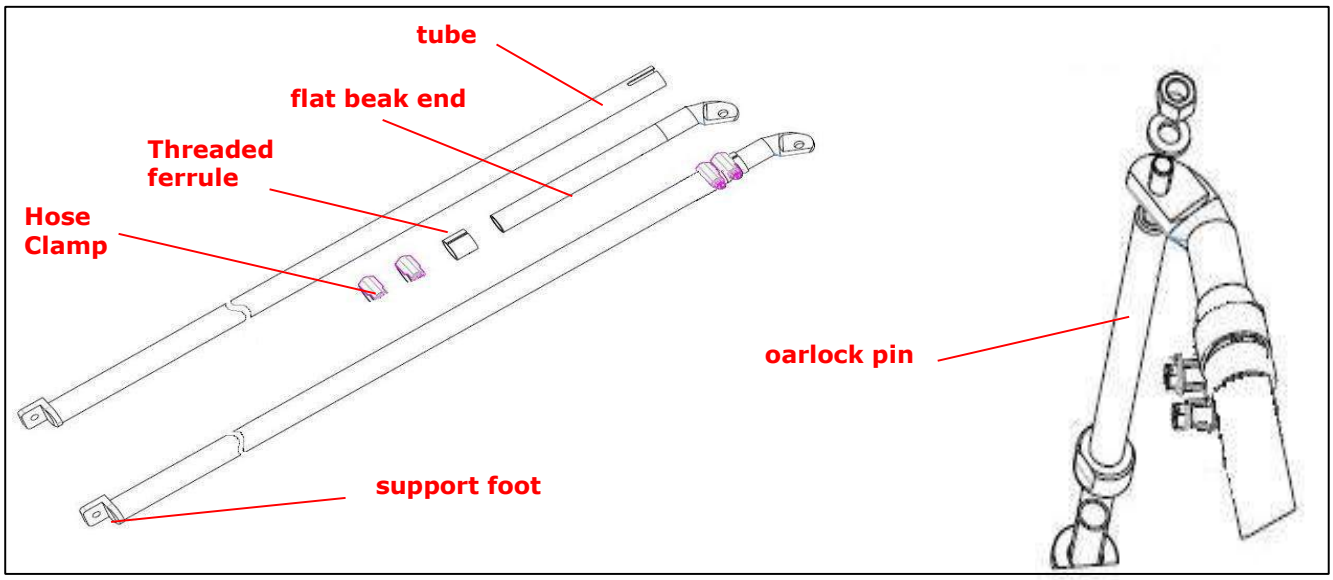


Incorrect assembly

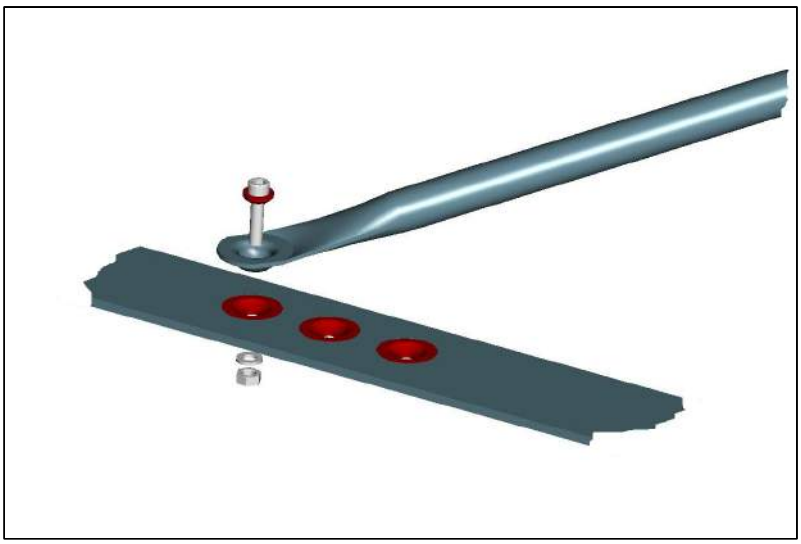


Correct assembly

- Then with a 13mm spanner tighten the nut at the head of the oarlock and with the 10mm spanner, the nut on the boat.

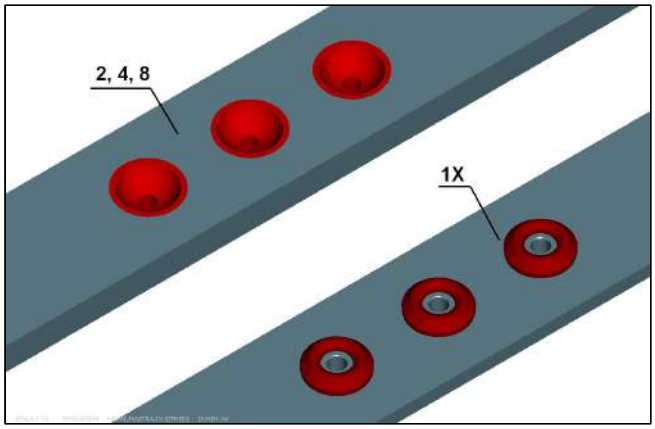


If the fifth tube is equipped with an adjustable support foot, it is necessary to install it as indicated in the figure to the right, positioning the appropriate semi-spherical washer between the head of the screw and the gunwale insert. Select the hole in the gunwale that limits the movement of the beak.



Fastening of adjustable support foot

It is possible to substitute this backstay with the one that comes equipped with the adjustable ferrule (see technical specifications sheet n.14) in that both use the same inserts positioned on the gunwale.
It is not possible to fasten the adjustable backstay on a boat that is not equipped with the appropriate inserts.



Types of inserts for the fifth tube

If it becomes necessary to replace a backstay, for boats that were built after 2009, it is sufficient to supply the serial number to the retailer, who will search for the necessary measurements in their database.

In other cases it will be necessary to purchase a tube that exceeds the necessary length in order to adapt it to any required measurements for the rigger, by simply following the instructions in the following list:

1- after having assembled the rigger, position the fifth tube on the rim of the gunwale, lightly tightening nut 'A', and insert the beak on the pin of the oarlock, positioning it, as indicated in the figure, at the maximum span.

2- make a mark with a pen on the tube, corresponding to the halfway point in the length of the beak.

3- remove the tube and cut it at the previously marked length.

4- cut it in a longitudinal direction in order to create two slots of approximately 2-3 cm in length at the end of the tube.

5- Assemble as described above.

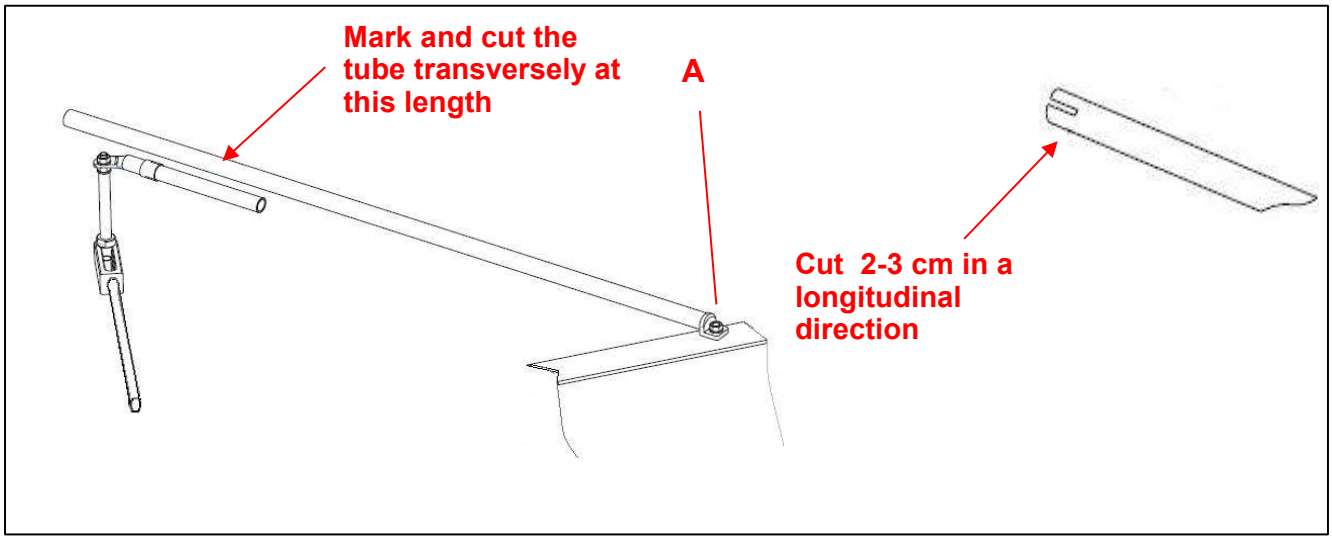


Diagram for the adaption of the backstay

Maintenance

It important, to ensure maximum efficiency of the boat, to maintain all the parts both before storage and during use.

Remove the backstay from the rigger and from the boat.
Remove the elastic bands and remove the flat ended (beak) piece from the tube.
Clean all components with neutral degreaser.
If necessary remove salt and calcium deposits or residue using a calcium removal product.
Reassemble the parts lubricating the hose clamps.

This maintenance should be performed monthly.

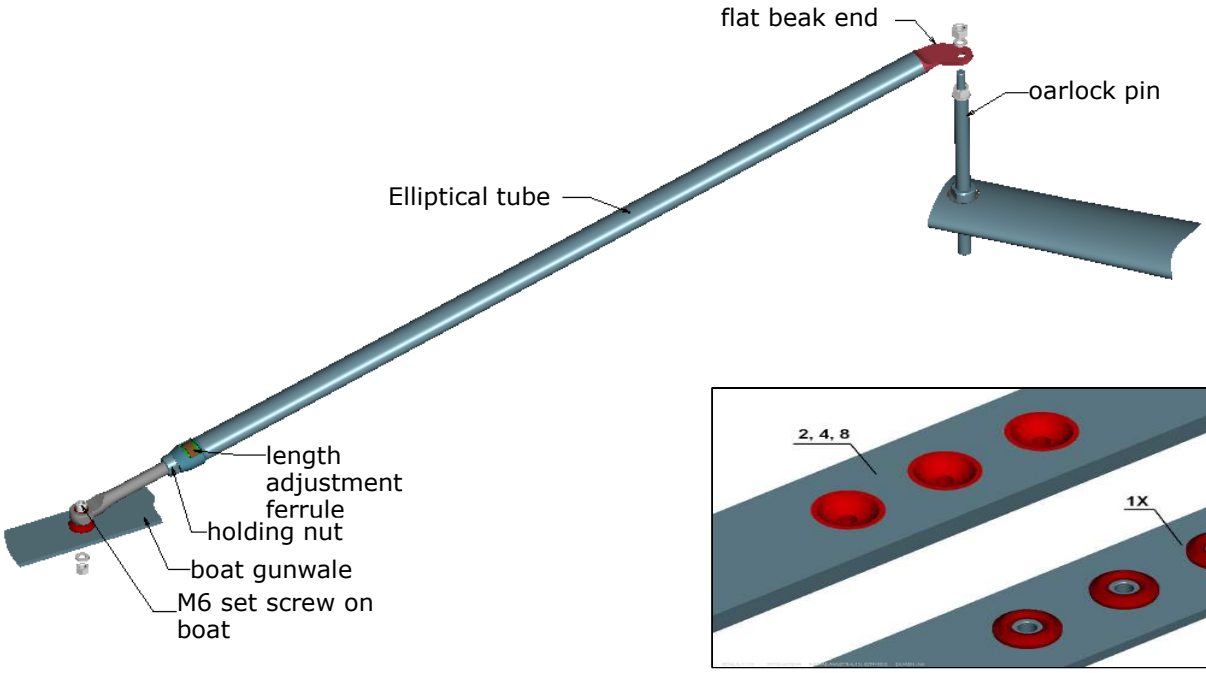
Warning:
The guarantee is valid only if correct maintenance procedures are performed!

Tools required:

- 7mm spanner
- 10mm spanner
- 2x13mm spanner
- no. 4 Allen key
- no. 5 Allen key (single scull)

ADJUSTABLE BACKSTAY

The main features of this backstay are:
- Increased resistance to bending, obtained using a tube with an elliptical section;
- Maximum adjustability, obtained with a spherical attachment on the gunwale;
- Better transmission of the force exerted on the oar to the boat, guaranteed by improved tightening of the fifth tube to the gunwale.
- Lower degree of bending in tube due to its shorter length: more holes made on the gunwale in order to adapt the fifth tube to any setting of the rigger. This feature also provides better transmission of the oar's force.



Type of inserts for backstay

Fasten the backstay to the boat gunwale as in fig.1.

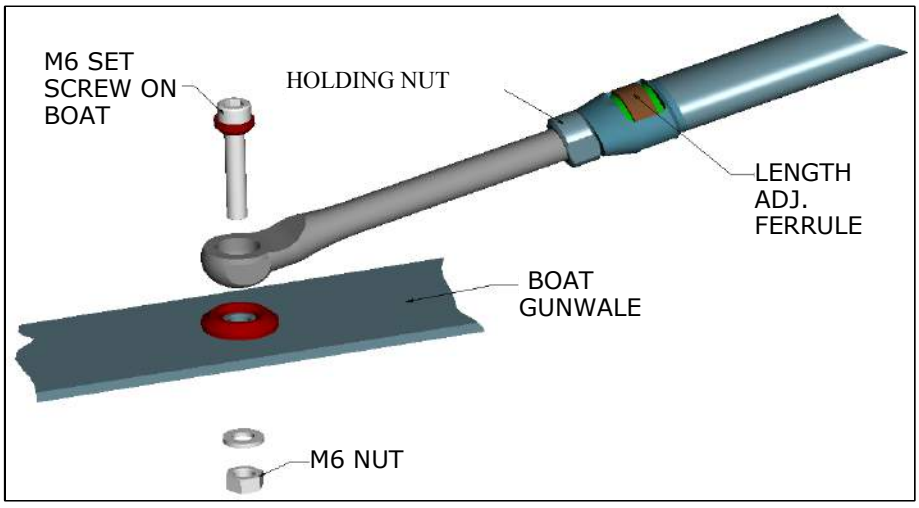


Fig. 1 – How to fasten the backstay to the boat gunwale.

Use the ferrule to obtain the right tube length and fasten the flat beak end to the oarlock pin. See fig. 2.

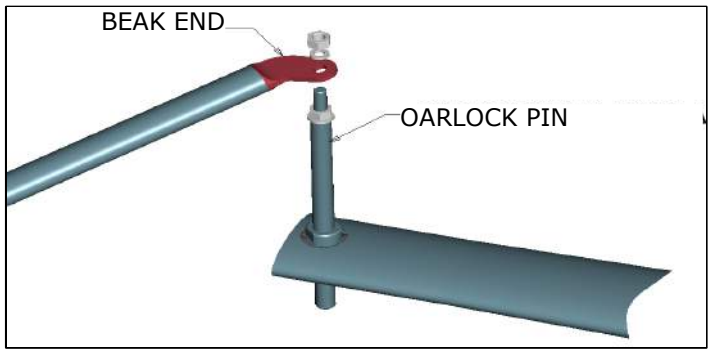


Fig. 2 – fastening of beak end to oarlock pin.

Tighten the backstay with the ferrule and M8 nut on the pin above the beak end (note the beak is between the two M8 nuts). Tighten the holding nut with 17mm spanner as in fig. 3.

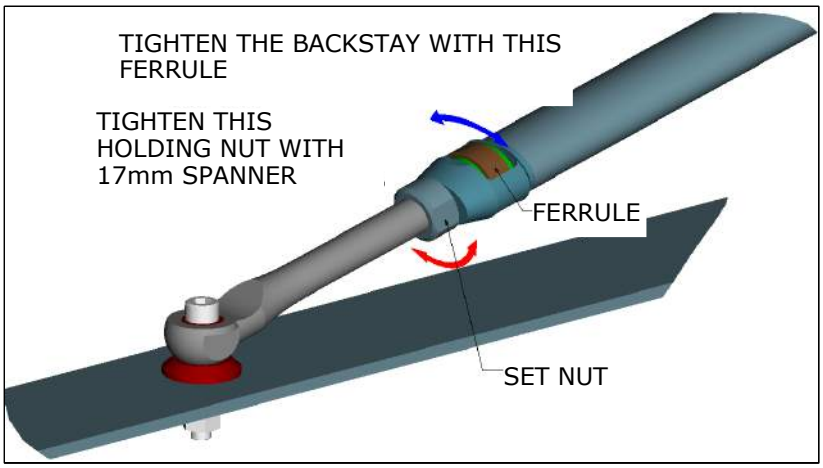


Fig. 3 – Tightening ferrule and holding nut.

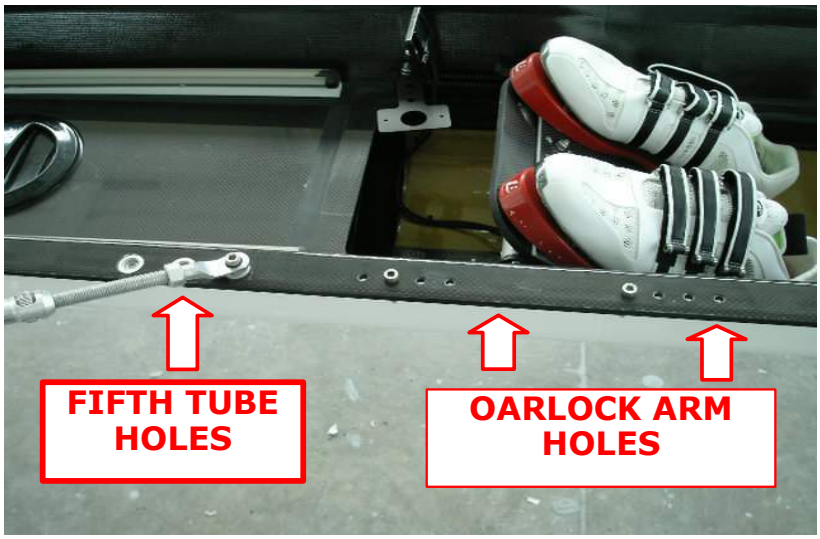


Fig. 4 – Photo of boat equipped with the adjustable backstay.

Maintenance

It important, to ensure maximum efficiency of the boat, to maintain all the parts both before storage and during use.

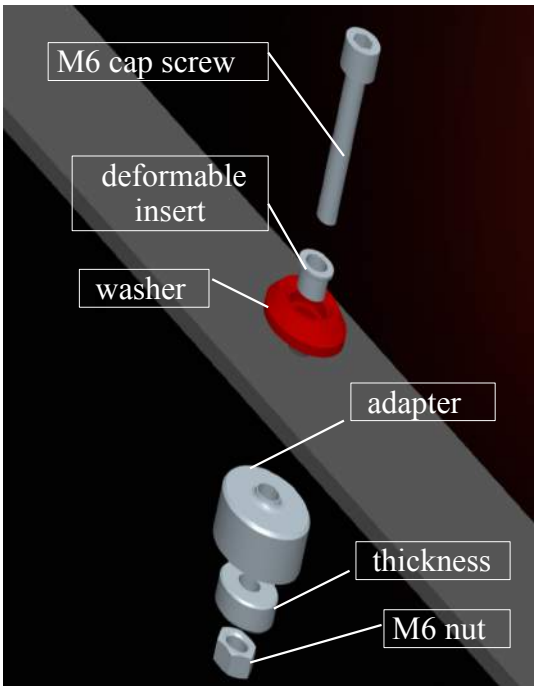
Remove the backstay from the rigger and from the boat.
Remove the support foot loosening the nut with a 17mm spanner.
Clean all components with neutral degreaser.
If necessary remove salt and calcium deposits or residue using a calcium removal product.
Reassemble the parts lubricating the threaded parts.

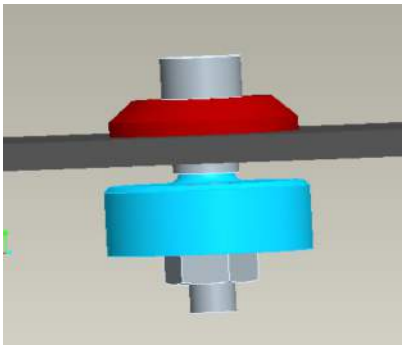
This maintenance should be performed monthly.

Warning: The guarantee is valid only if correct maintenance procedures are performed!

Repair

To replace the insert (washer and deformable insert) it is better to ask Filippi team help. If it is not possible, follow these steps:
- break the deformable insert using a drill with maximum caution.
- set the deformable insert in the washer and in the hole of the boat gunwale.
- put a M6 cap screw inside the insert
- put the adapter and the thickness in the screw and fix the nut as showed in the picture.





- Using a no. 5 Allen key keep the screw fixed while rotate slowly the nut with a 10mm spanner. With this action the deformable insert will be opened till to catch the boat gunwale
- Remove the nut and all tools used.

N.B.: it is necessary a great force to deform the insert so it could happen to break the screw; in this case replace the screw and repeat the operation.

Tools required

- 10mm spanner
- 2 x 13mm spanner
- 17mm spanner
-no. 4 Allen key
- no. 5 Allen key

Filippi
RACING ROWING BOATS

CARBON TUBE RIGGER

General considerations

- The main feature of the carbon tube rigger is that, because of its structure, each variation of a parameter setting (span, height...) corresponds to a variation in other parameters (at times negligible), which explains why it is strongly recommended that the structure be calibrated gradually, by varying the parameters in small steps and not setting one parameter at a time.

- As above, for the setting it is advisable to do it in small steps bearing in mind that the variation of a parameter, for geometric reasons, results in the variation of others as summarized in the following table:

Height ↗	Span ↘	Distance from Z-L ↗
Height ↘	Span ↗	Distance from Z-L ↘
Span ↗	Height ↘	Distance from Z-L ↘
Span ↘	Height ↗	Distance from Z-L ↗
Distance from Z-L ↗	Height ↗	Span ↘
Distance from Z-L ↘	Height ↘	Span ↗

Increasing: ↗
Decreasing: ↘

Table 1. Relationship between the parameters of the oarlock (eg, increased height results in decrease in the spread and increased distance from the oarlock to the Zero Line)

This table loses its validity when you vary two parameters contemporaneously (eg. if we decrease both the height and distance from the seat line, the spread does not always increase).

- The height and distance of the pin from the seat line can be changed accurately (consistent with the values of the required parameters), while for geometrical reasons, it is sometimes necessary to accept a compromise on the span/spread value.

Assembly and Calibration

Check that the serial numbers of the boat and riggers correspond; pay attention to the number of rowing seats indicated on each rigger during assembly.
The serial number is indicated on the load-bearing tube near the support foot (see the photo at right).

1- Without fastening, position the load bearing tube on the boat turning the upper screw the M6 nut, being careful not to entirely loosen the screw for hole 'f' of the boat.

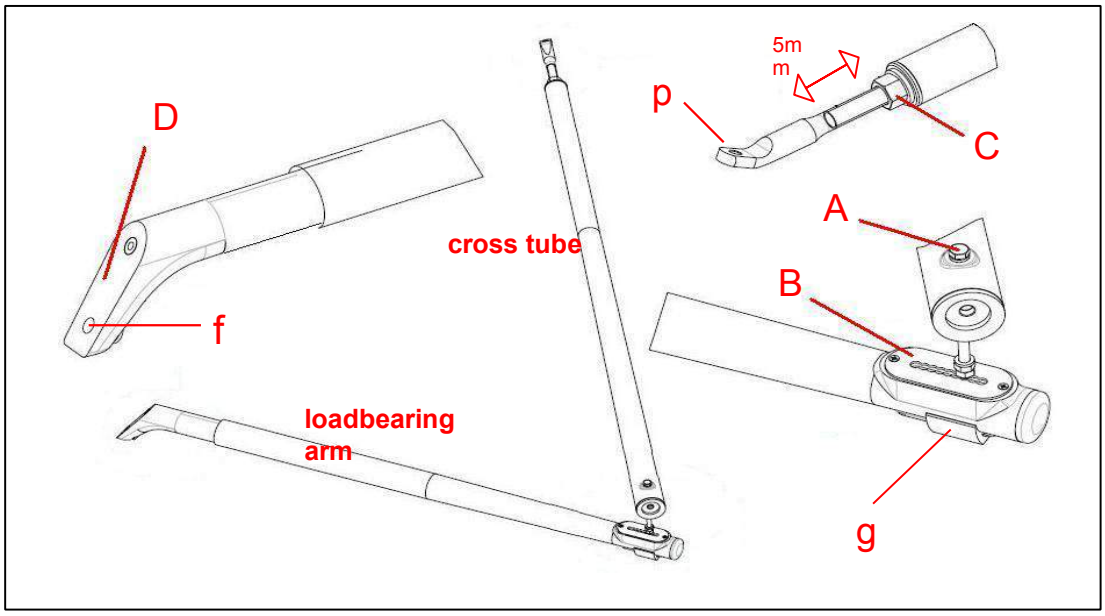
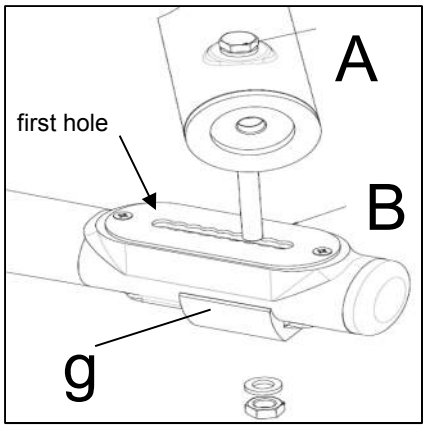


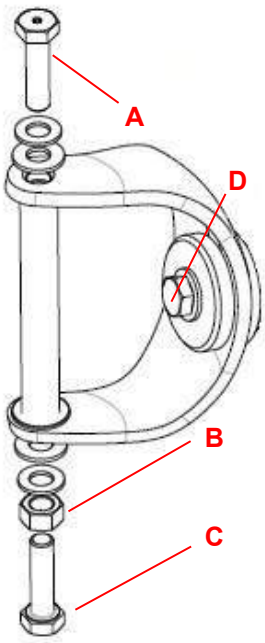
Fig 1. Structure of Mono-tube carbon rigger

2 - Loosen, with a 19mm spanner, nut 'C' leaving about 5mm of thread in sight. Connect the cross tube to the loadbearing arm by inserting screw 'A' in the first hole (the one closest to the boat) of plate 'B'. Insert the 'g' U-piece and position with a 10mm spanner.



3 - Connect the base of the cross tube to the boat tightening the nut with a 10mm spanner. Tighten the loadbearing arm to the boat and bolt 'A'.

4 - With the help of the pitch-meter (see technical specifications page 11) position the hilt as desired.



To adjust the inclination angle of the oarlock pin, loosen screw 'D' with a 13mm spanner and then position the hilt by turning it and running it along the central slot; tighten screw 'D'.

To remove the oarlock pin, use two 13mm spanners on nut 'B' and screw 'C' and turn 'B' until it touches the washers and the hilt. Move the spanner from 'B' to 'A' and release 'A'.
Bring the spanner back to 'B' to loosen both screw 'C' and nut 'B'.

During reassembly after tightening around half of 'C' screws, careful to leave a few threads free between screw 'C' and nut 'B', tighten first nut 'B' and then the two screws 'A' and 'C'.

5- To begin mounting the rigger on the rowing seat nearest the stern, measuring the distance of the oarlock to the seat line (with the method indicated in the technical sheet No 9) and in the case of double scull riggers, the equality of the distances of each oarlock pin to the stern (see Figure 2).

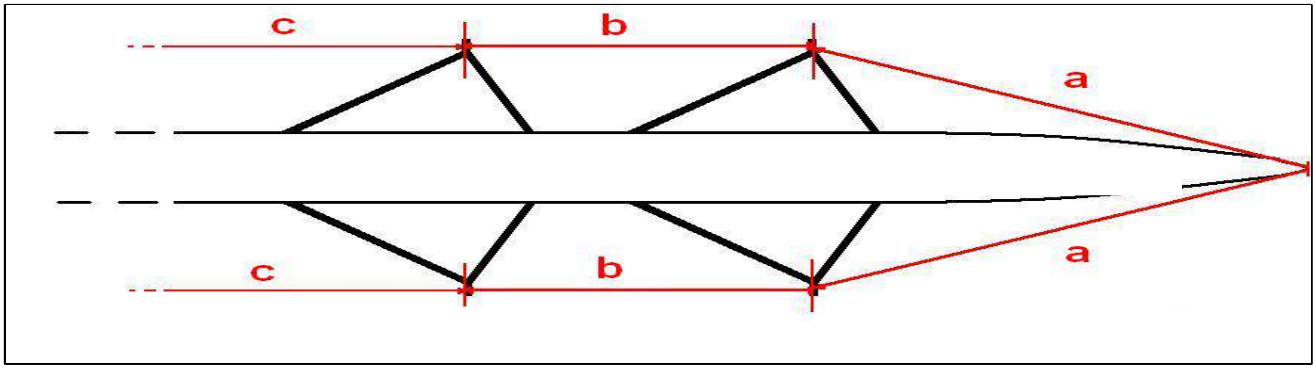


Fig. 2 Distances to check

6- Measure the span/spread and the height (as shown in the technical specifications page No. 9). Being aware of the 3 parameters settings of our oarlock (span/spread, height and distance from the seat line), it is now possible to plan actions for achieving the required measurements, considering that:

HEIGHT:

For small increases/decreases black PVC n° 8 washers are available to be placed above and/or below the oarlock (it is advisable to keep the oarlock from having direct contact with the hilt).

For major changes there are two wedges available (for changes of 1cm and 1.5cm), to be inserted between the foot 'D' and the boat, simply by loosening the screws (see fig.3).

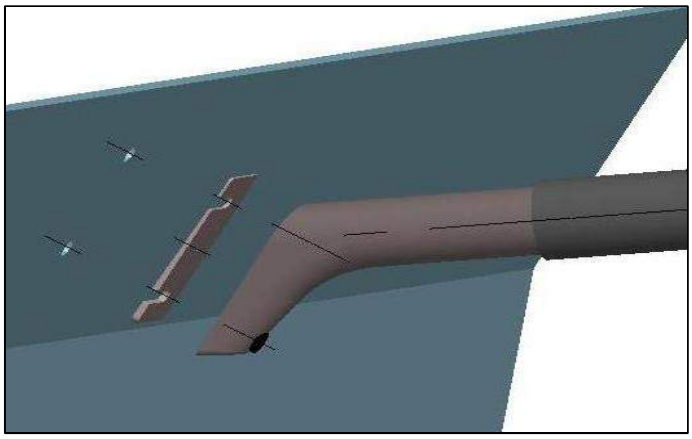
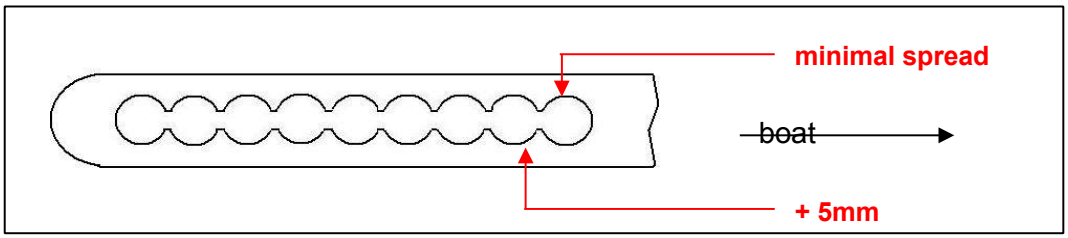


Fig. 3 Assembly of the wedge

For the considerations at the beginning of the instructions, it is advisable to loosen or, if necessary, remove the bolt from the hole 'P' (see Figure 1) and, at the end adjust the length of the cross tube naturally checking the other parameters.

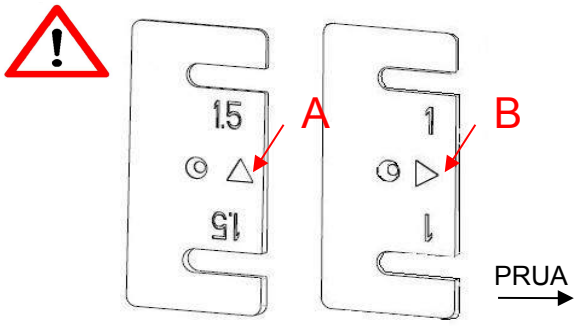
SPAN/SPREAD:

To adjust the span/spread there is a series of holes on plate 'B' at intervals of 5 mm each (in the case of double sculls, of course, the step is 5 +5 = 10mm).
At the end, be sure to check the length of the cross tube and the other parameters.



OARLOCK-ZERO LINE DISTANCE:

To change this there are two wedges (for changes of 1cm and 2cm), to insert between the base 'D' and the boat, simply by loosening the screws (see fig.3). Regarding considerations made at the beginning, it is advisable to loosen or, if necessary, remove the bolt from hole 'p' (see Figure 1) and at the end, adjust the cross tube length and the other parameters.



The wedges for height, and those for making the boat bow-heavy, can of course be assembled together.

Note that on the wedges, for easier use, there is a stamped triangular arrow that indicates the direction of the action on the wedge: it indicates the shift direction of the rigger.

For example, with the boat resting on the keel, mounting the wedge as shown in the figure, in case 'A' the rigger will increase the height by about 1.5cm, while with the wedge 'B', the action will be of about 1cm.

In the case of multiple boats, it is now possible to mount the rigger for the rowing seat adjacent and perform the same operations.

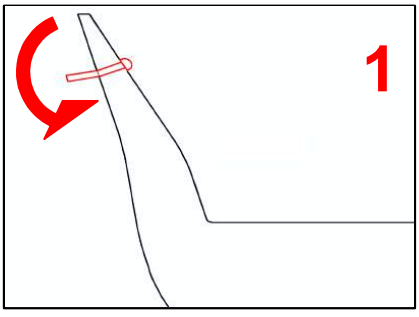
Maintenance

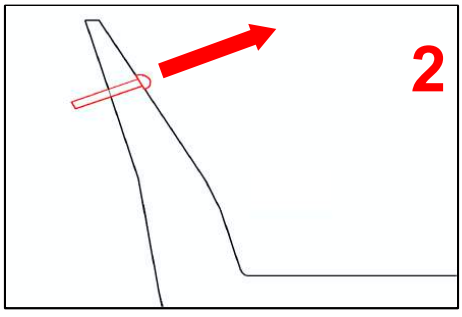
It important, to ensure maximum efficiency of the boat, to maintain all the parts both before storage and during use.
Remove the riggers by removing the screws connecting with the boat and separate the two tubes and the support foot 'p' as in figure 1.
Remove the pin, the hilt and remove the washers from the oarlock pin.
Clean all components with neutral degreaser and if necessary remove salt and calcium deposits or residue using a calcium removal product.
Reassemble the parts lubricating the threaded parts.
This maintenance should be performed monthly.

Repair

Warning:
The guarantee is valid only if correct maintenance procedures are performed!

If it is necessary to change the support screws, they must first be straightened and then unscrewed as shown in the image below





Tools Required:

- 10mm spanner
- 2X13mm spanner
- 19mm spanner
- no.4 Allen key
- Measuring tape
- Pitch meter
- Height measurement stick

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RACING ROWING BOATS

ALUMINUM WING RIGGER

Assembly

Check that the serial number on the boat corresponds to those of the riggers; pay attention to the rowing seat number indicated on each rigger during the assembly.
Place supports on gunwale, careful to match holes left and right; keep in mind that the hole indicated with a white line corresponds with the zero line. Be sure to use the same holes on both the right and left.
Install the fifth tube following the instructions in Technical specifications No.13.

To improve load distribution, the aluminum rigger wing for sweep was designed with a special shape and different mounting method between the two gunwales: do not reverse or modify the fastening screws!

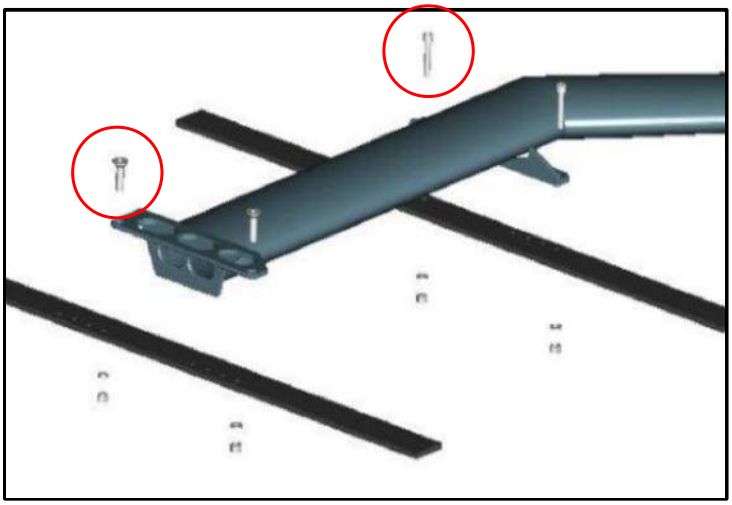


Fig. 1 Rim drilled for aluminum wing rigger

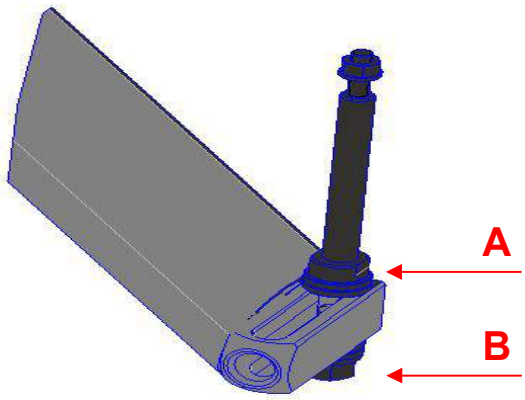
Calibration

Adjust the span/spread with the help of two 19mm spanners: keep the pin still with nut 'A' and loosen 'B'.

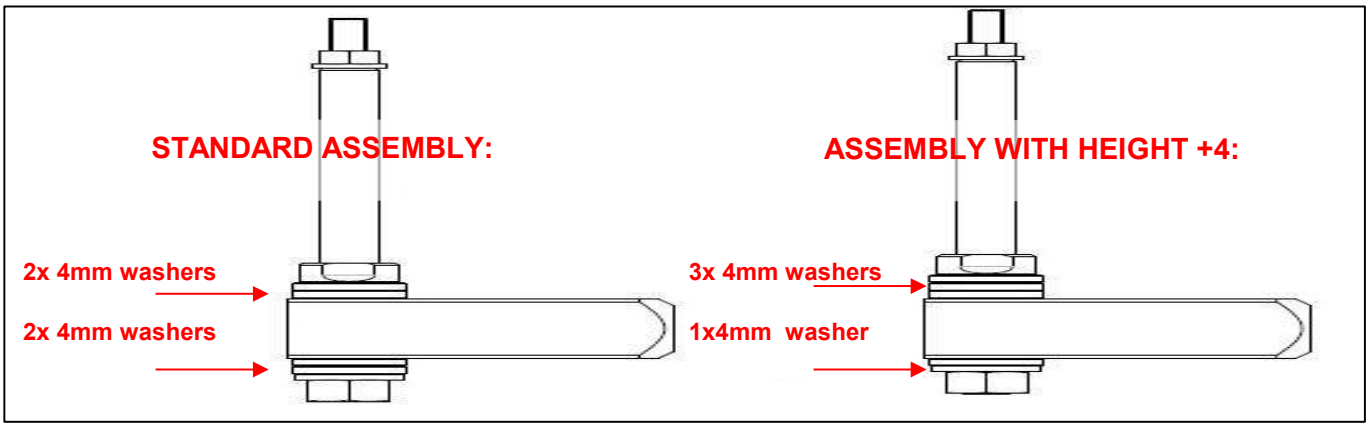
Widen the oarlock(s) to the desired span/spread.

In the case of sculling make sure the semi-spans are equal.

Tighten the pin definitively.



• The height can be adjusted by inserting 2mm PVC washers and those in 4mm aluminum. For greater increases you can request padding components to place between the gunwale and rigger supports.



• The distance from the zero line can be adjusted by simply moving the rigger backward or forward in the holes of the gunwale; bear in mind that each step is an advancement of 20 mm.

Always take care to use the same holes on the right or left.

• To vary the lateral inclination of the pin, use the special washers as indicated in the technical specifications page No. 19.

For a correct measurement of the spread or height, see the technical specifications page (No. 9)

Maintenance

It important, to ensure maximum efficiency of the boat, to maintain all the parts both before storage and during use.
Remove the riggers by removing the nuts connected to the boat.
Remove the fifth tube and maintain it according to technical specification sheet No. 13.
Remove the pin.
Remove the oarlock and washers from the pin.
Clean all components with neutral degreaser.
If necessary remove salt and calcium deposits or residue using a calcium removal product.
Lightly grease sides with melted petroleum jelly or lithium-based marine grease
Reassemble the parts.
This maintenance should be performed monthly.

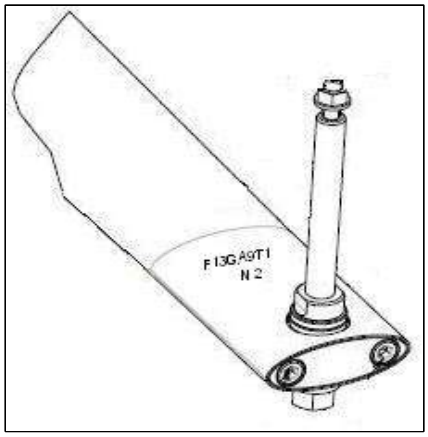
Warning:
The guarantee is valid only if correct maintenance procedures are performed!

Tools required:

- 10mm spanner
- 13mm spanner
- 17mm spanner
- 19mm spanner
- n°4 Allen key
- n°5 Allen key
- Measuring tape
- Oar adjuster
- Height measure stick
- backstay tools

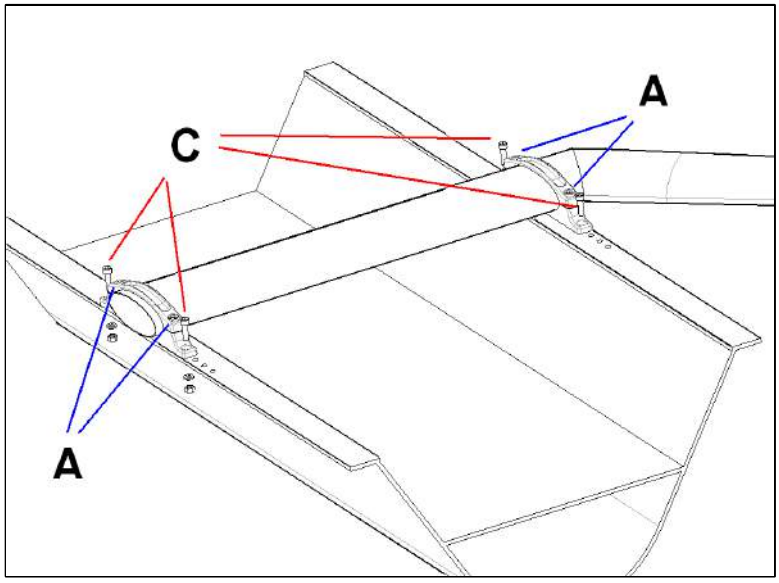
CARBON WING RIGGER

Assembly



Check that the serial number of the boat corresponds to that of the riggers; pay close attention to the rowing seat number indicated on each rigger during assembly.
Loosen the holding clamps by turning screws 'A' and positioning the supports on the gunwale, ensuring that the holes on both left and right correspond; keep in mind that the hole indicated with a white line corresponds with the zero line.
Tighten screws 'C' and calibrate the span as follows.
Install the fifth tube following the instructions in the technical specifications sheets n.13 or n.14.

Calibration



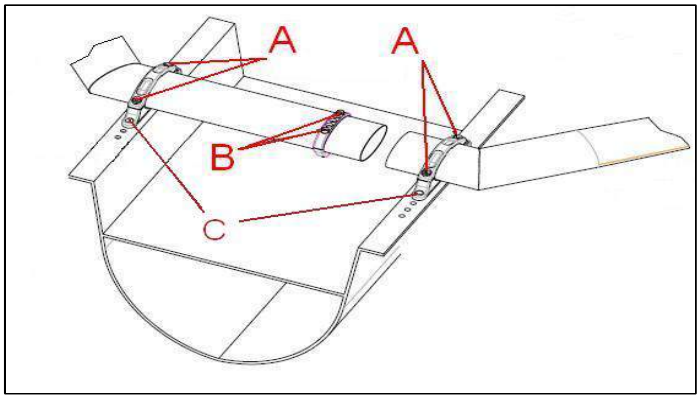
• To adjust the spread/span, do as follows:

SWEEP RIGGERS

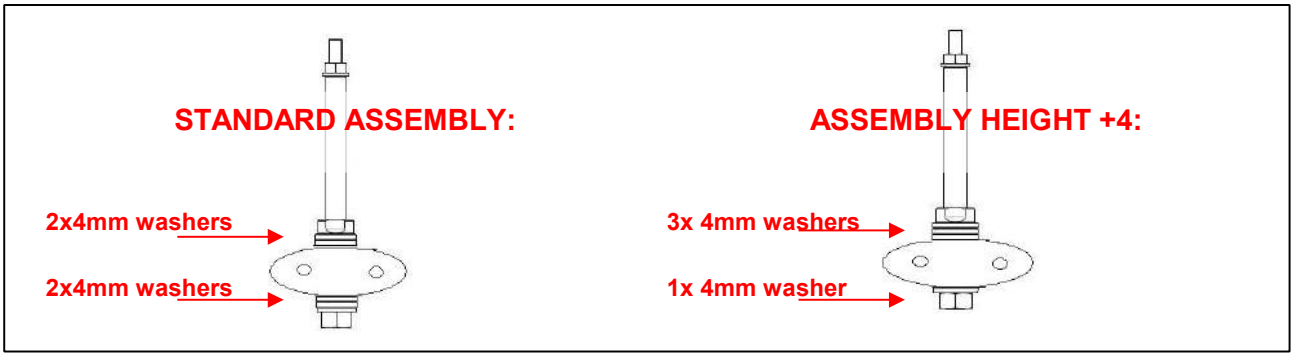
- slightly loosen screws 'A'
- position the rigger to the desired measurement
- tighten screws 'A'.

SCULLING RIGGERS

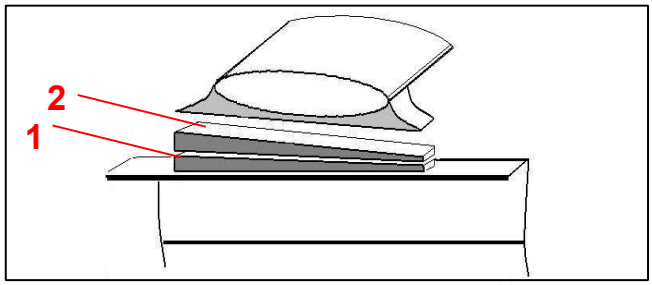
- slightly loosen screws 'A'
- slightly loosen screws 'B'
- widen or tighten the two parts of the rigger to the desired span (measurements indicated at the center of the rigger)
- tighten screws 'B'
- check that the rigger is centred in the boat by assuring the oarlock pins are equidistanced from the boat centreline
- tighten screws 'A'.



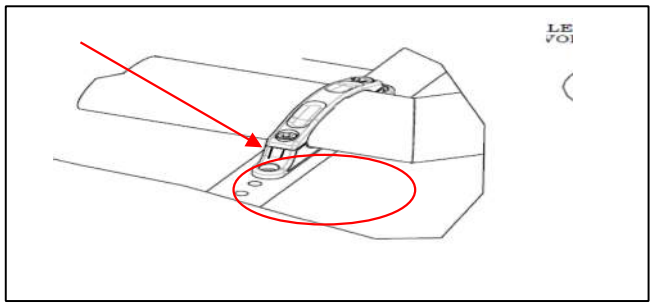
• The height can be varied by inserting 2mm PVC washers or 4mm aluminum washers. To further increase or decrease measurements, calibrated wedges are provided to put between the rim and rigger supports.



To increase the height, insert the wedges with the higher part directed toward the bow and position them in the same direction, as indicated in the figure to the right.
Bear in mind that each wedge allows for an increase or decrease of approximately 1 cm.



It is possible to use clamps with the inner base tilted 1cm or 2cm (identified respectively by 1 or 2 vertical lines on the higher support): install the clamps with the notches toward the bow to increase the height. Be sure to attach the right clamp with the same orientation as the left.



To correctly measure the span or height see the pertinent technical specifications sheets (n.9 and n.10).

• The distance from the zero line can be adjusted with screws 'C', simply by moving the rigger forward or backward in the holes on the gunwale; be careful to use the same holes on both left and right.

• To adjust the inclination of the pin slightly loosen screws 'T'; adjust the inclination of the pin as indicated in technical specification sheet n.11. Tighten the two screws by alternating with small rotations of both so as NOT to allow the internal metal block to tilt.

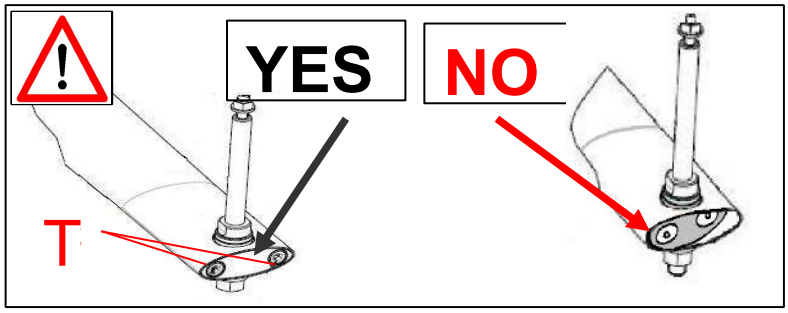


Fig. A Correct and incorrect assembly of the pin

The carbon wing riggers can be replaced with aluminum wing riggers without further alterations to the boat.

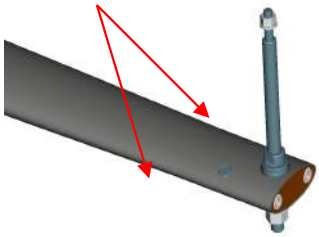
In the case of the 2- to invert the tack, exchange no. 1 with no. 2. In other cases simply reverse the rigger.

Maintenance

To ensure maximum efficiency of the boat, it is important to maintain all parts both before storage and during use.
Remove the riggers by removing the screws connected to the boat.
Remove the fifth tube and maintain it according to technical specification sheet No. 13.
Remove the pin and remove the oarlock and washers from the pin.
Remove the clamps and in the case of the sculling rigger, separate the two parts.
Remove the Allen screws from the arm (indicated with the letter 'T' in Figure) and pull out the sliding block and the titanium sphere.
Check the condition of the block (a part subject to wear) and, if necessary, replace.
Clean all components with a neutral degreaser.
If necessary, remove the deposits or residues of salt or calcium using a calcium removal product.
Lubricate the threads with lithium-based marine grease.
Reassemble the parts.
Maintenance operations must be performed monthly.

Warning: The guarantee is valid only if correct maintenance procedures are performed!

In some versions of the carbon wing riggers it is possible to replace the internal threaded insert where 'T' screws like those of Fig. A are worn, in case of necessity.



Transport

In addition to the information in the technical specifications sheet n.2, bear in mind that, to save space, you can separate the two parts of the double scull carbon rigger by loosening screws 'B'.

Use trestles or supports to place the boat with the keel upwards so as not to put weight on the riggers!

Tools required:

- 10mm spanner
- 17mm spanner
- 19mm spanner
- n.5 Allen key
- n.6 Allen key
- Measuring tape
- Pitch meter
- Height measure stick
- Backstay tools

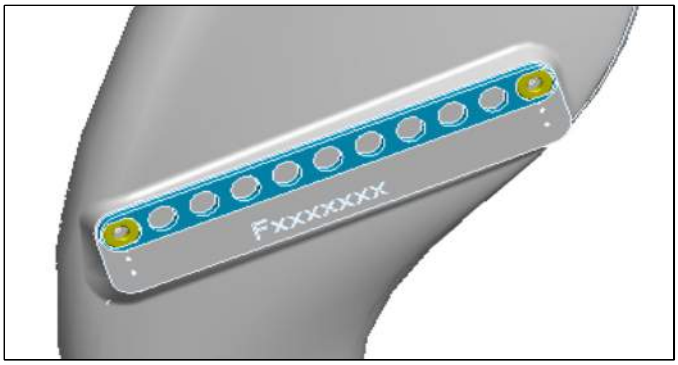
Filippi
RACING ROWING BOATS

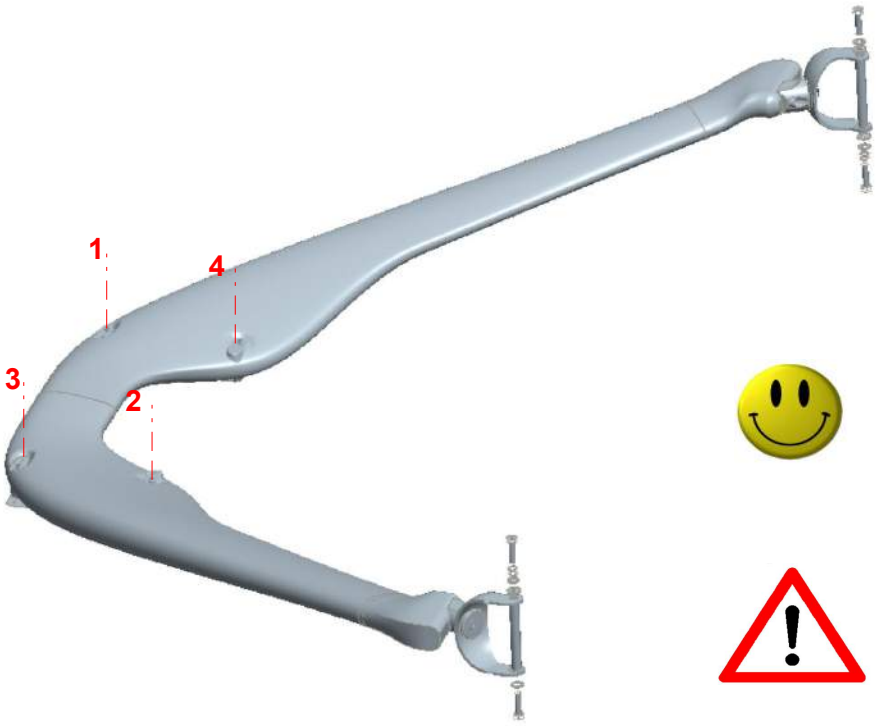
ALIANTE CARBON RIGGERS

Assembly

Check that the serial number of the boat corresponds to that of the riggers, paying attention to the rowing seat number indicated on each rigger during assembly. Using the bolts provided (1, 2, 3 and 4), attach the arm to the gunwale being sure to use the same holes on both sides of the boat: it is recommended that all four set screws be inserted, and moving the riggers slightly to make insertion easier, then position the nuts and tighten the bolts, crossing right with left.

In case of the new Aliante Carbon rigger the serial nimber is located under the front foot.



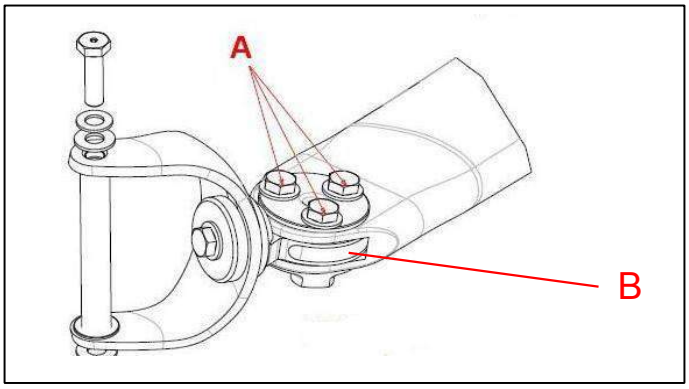


The new release of Aliante carbon rigger can be replaced with aluminum one without further alterations to the boat.

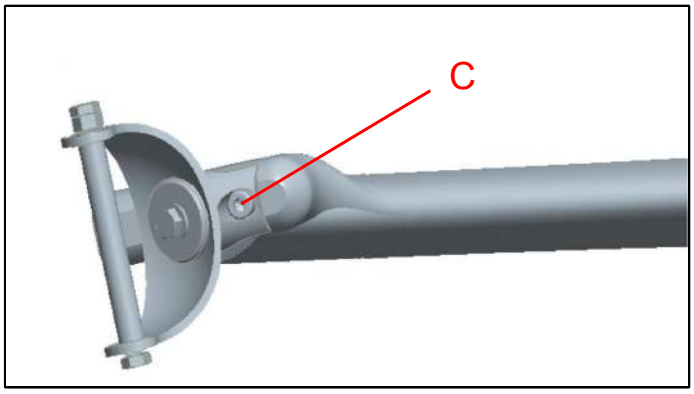
It is not possible to replace the first Aliante with the second release

Calibration

• To adjust the span, slightly loosen the three 'A' screws. Widen the hilts to the desired span. Check that the semi-spans are equal. Tighten the screws 'A'.

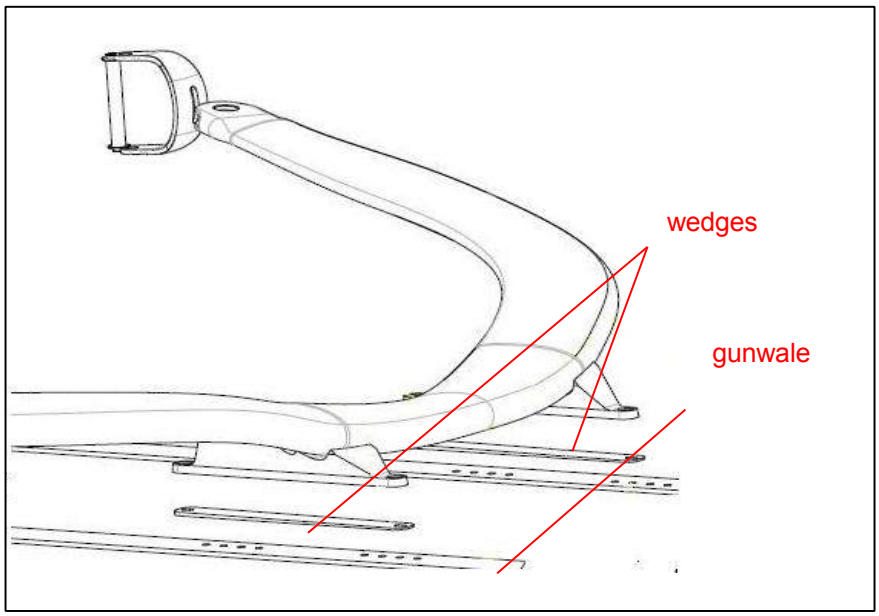


With the new release of Aliante Carbon rigger, to adjust the span, it is necessary to loose only the screw 'C'. Then check that the semi-spans are equal and tighten 'C'.

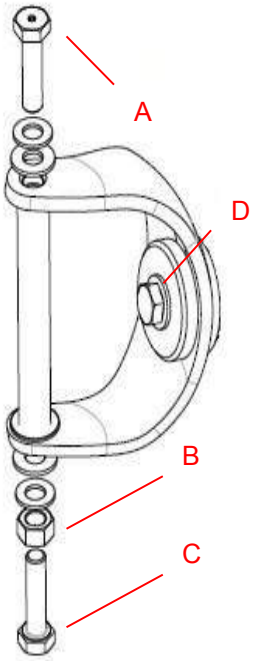


Bear in mind that an adjustment in the span causes a variation in the angle of the pin.

• For small changes in height it is necessary to use the washers (2mm thick, in PVC), while larger adjustments can be made with the appropriate wedges placed between the gunwales and the rigger support feet (place the higher part toward the stern to increase height and vice versa).



• To adjust the oar blade angle loosen the 'D' screw with a 13mm spanner then slide the hilt along the central slot. Slightly tighten the screw and, with small taps, rotate the hilt in the desired direction; tighten screw 'D'. It is strongly advised to use the pitch-meter (technical specifications sheet n.11)



To remove the oarlock pin, use two 13mm spanners on nut 'B' and screw 'C': block nut 'B' bringing it up into contact with the washers and the hilt.
Move the spanner 'B' to 'A' and loosen 'A'.
Move the spanner on 'B' is to loosen screw 'C' and nut 'B'.

During assembly, after tightening around half of the 'C' screws, leaving some threads visible between screw 'C' and nut 'B', first tighten nut 'B' and then the two screws 'A' and 'C'.

To correctly measure the span and height see the technical specifications sheet (n°9)

• The distance from the zero line can be adjusted simply by moving the riggers forward or backwards on the holes in the gunwale. keep in mind that the hole indicated with a white line corresponds with the zero line. Be sure to use the same holes on both the right and left.

Maintenance

To ensure maximum efficiency of the boat, it is important to maintain all parts both before storage and during use.
Remove the riggers by removing the screws connected to the boat.
Remove the pin, the hilt and remove the oarlock with the washers from the pin.
Remove the 3x M8 ('A') screws with the 13mm spanner and remove component 'B'.
Clean all components with a neutral degreaser.
If necessary, remove the deposits or residues of salt or calcium using a calcium removal product.
Lubricate the threads with lithium-based marine grease.
Reassemble the parts.
Maintenance operations must be performed monthly.

Warning: The guarantee is valid only if correct maintenance procedures are performed!

Tools required:

- **10mm spanner**
- **2x13mm spanner**
- **no.4 Allen key**
- **no.5 Allen key**
- **Measuring tape**
- **Pitch meter**
- **Height measure stick**

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WASHERS FOR PITCH ADJUSTMENT

These are required for the lateral inclination (pitch) of the pins in the aluminum wing and standard tubular riggers.

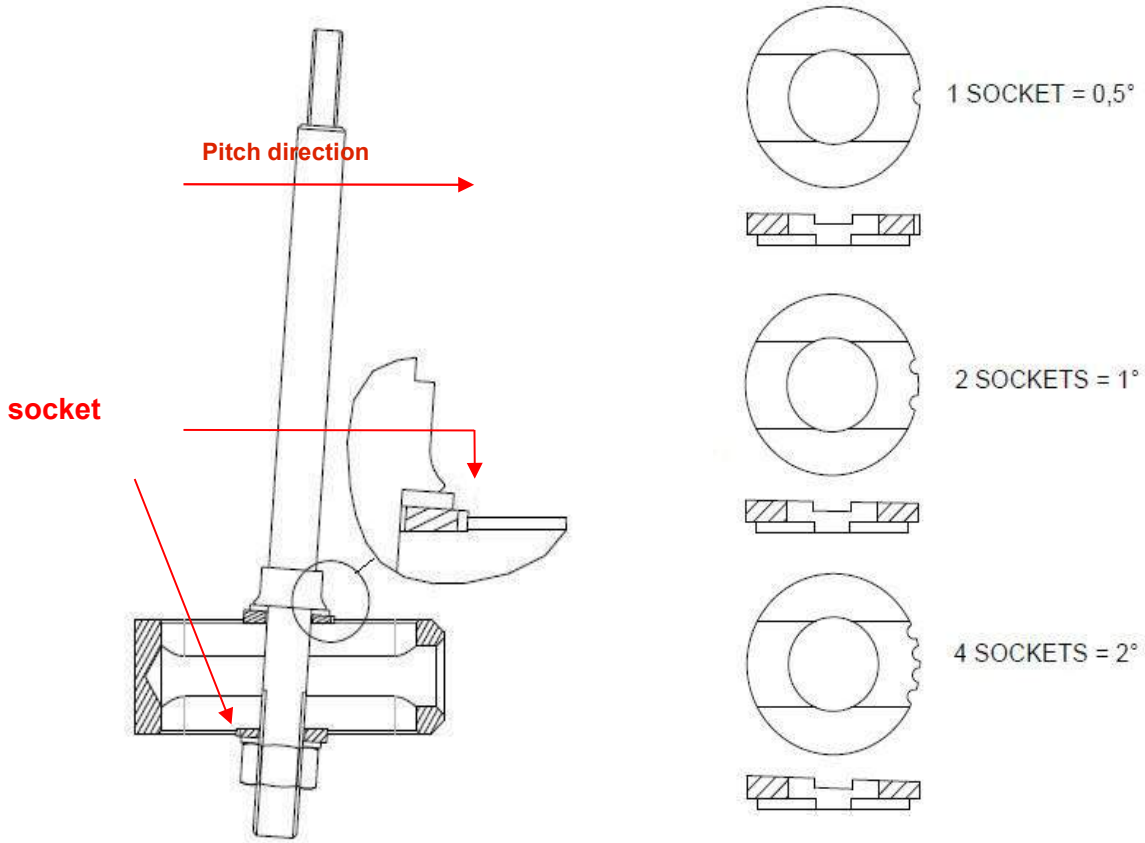
Instructions

- It is necessary to install two washers on each oarlock, one on top and one on the bottom of the oarlock, positioned in opposite directions from each other.

- The washer sockets indicate the direction of the pin's pitch.

- To obtain positive pin pitches, you must place the washers on the oarlock with the sockets positioned as follows:
    1. on the outside of the arm on the upper part;
    2. on the inside on the lower part.

It is possible to use several washers together to increase the pitch (eg with three washers a pitch of 3.5 ° can be reached); couple the washers by matching the sockets.



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CONCEPT2 BUSHINGS

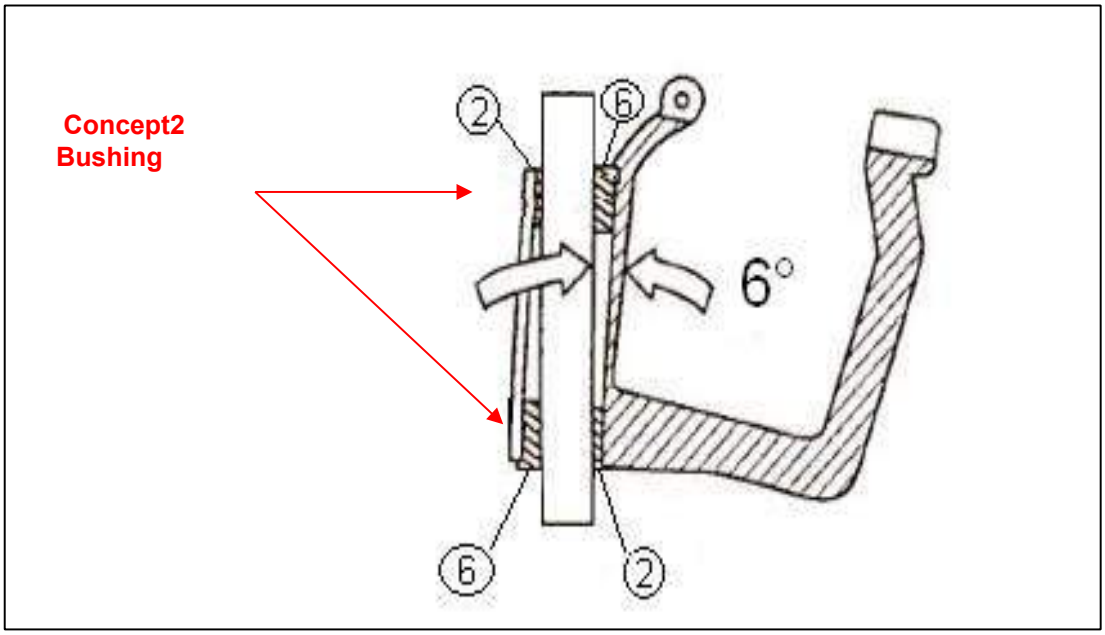
These are useful for increasing the longitudinal pitch of all oarlocks.
Contrary to the adjustments described for the riggers, with this system the pitch of the pin is not changed but rather that of the oarlock.

Instructions

- Use two bushings for each oarlock, one on the upper part and one on the lower, placing them in opposite directions to each other.

- On each bushing, there is an indication of which angle will increase the pitch of the pin up to a maximum of seven degrees: 4°-4°, 5°-3°, 6°-2°, 7°-1°.

- The base value of the oarlock pitch of the Concept2 (both the adjustable and non-adjustable models) is 4°.



In the diagram (from the website www.concept2.com) note an example of the use of bushings 6°-2°

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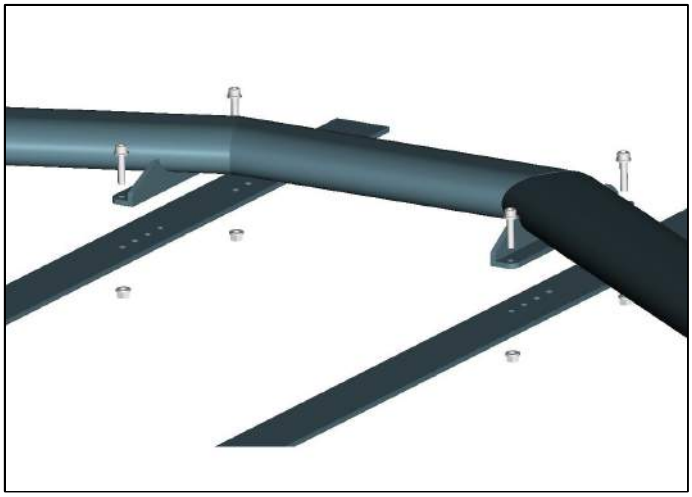
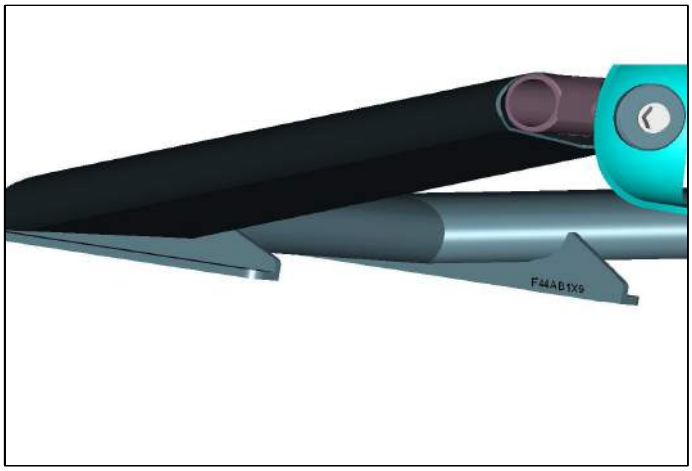
ALIANTE ALUMINUM RIGGER

Assembly

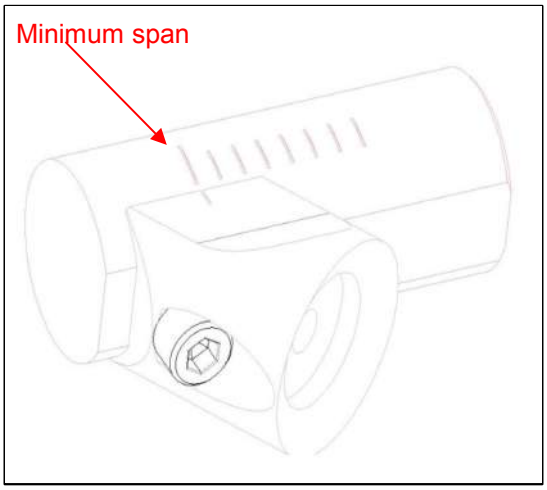


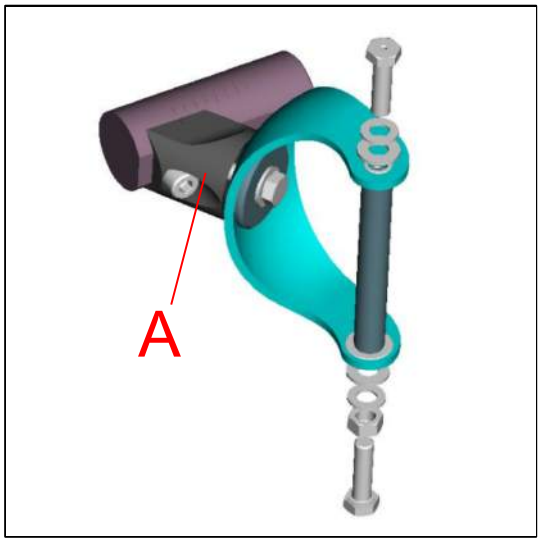


Check that the serial number of the boat matches that of the riggers: pay attention to the rowing seat numbers indicated on each rigger during assembly. Using the bolts provided, attach the rigger to the gunwale, taking care to use the same holes on both sides of the boat: it is recommended that all four set screws be inserted, and moving the riggers slightly to make insertion easier, then position the nuts and tighten the bolts, crossing right with left.

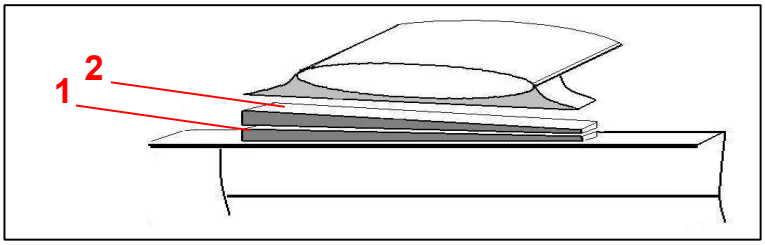
Calibration

To adjust the span, turn the Allen screw and slide the oarlock being careful to follow the same steps both on the right and left (the ribbing on the arm defines one step of 5 mm per side).





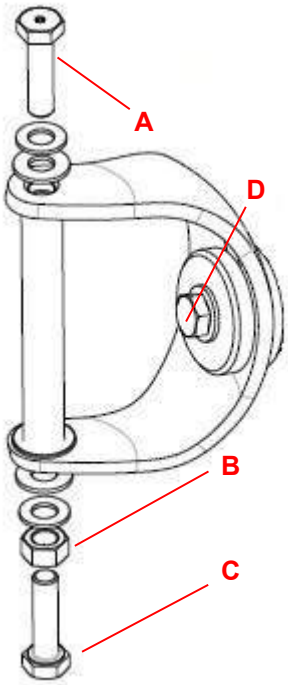
• To make small changes in height can use the black PVC 2mm washers.
If, however, you want a more substantial change in height, use the wedges provided: always position them in the same direction and to increase the height value, direct the highest part towards the stern as shown below.
Bear in mind that each wedge allows for an increase of about 1 cm.



• The distance from the zero line can be adjusted simply by moving the riggers forward or backwards on the holes in the gunwale. Be sure to use the same holes on both the right and left side. keep in mind that the hole indicated with a white line corresponds with the zero line.

• To adjust the pitch, loosen the screw 'D' with a 13mm spanner and then slide the hilt along the central slot. Lightly tighten the screw and, with small taps, turn the hilt in the desired; tighten screw 'D'.
To remove the pin from the oarlock, grip nut 'B' and screw 'C' with two 13mm spanners and then grip 'B', moving it up until it touches the washers and the hilt.
Bring the spanner over from 'B' to 'A' and loosen 'A'.
Bring the spanner back to 'B' to loosen both screw 'C' and nut 'B'.

When reassembling, after tightening around half of the 'C' screws, taking care to leave some threads visible between screw 'C' and nut 'B', tighten first nut 'B' and then the two screws 'A' and 'C '.



To correctly measure the span and height see the technical specifications sheet (n°9 and n°10)

Maintenance

To ensure maximum efficiency of the boat, it is important to maintain all parts both before storage and during use.

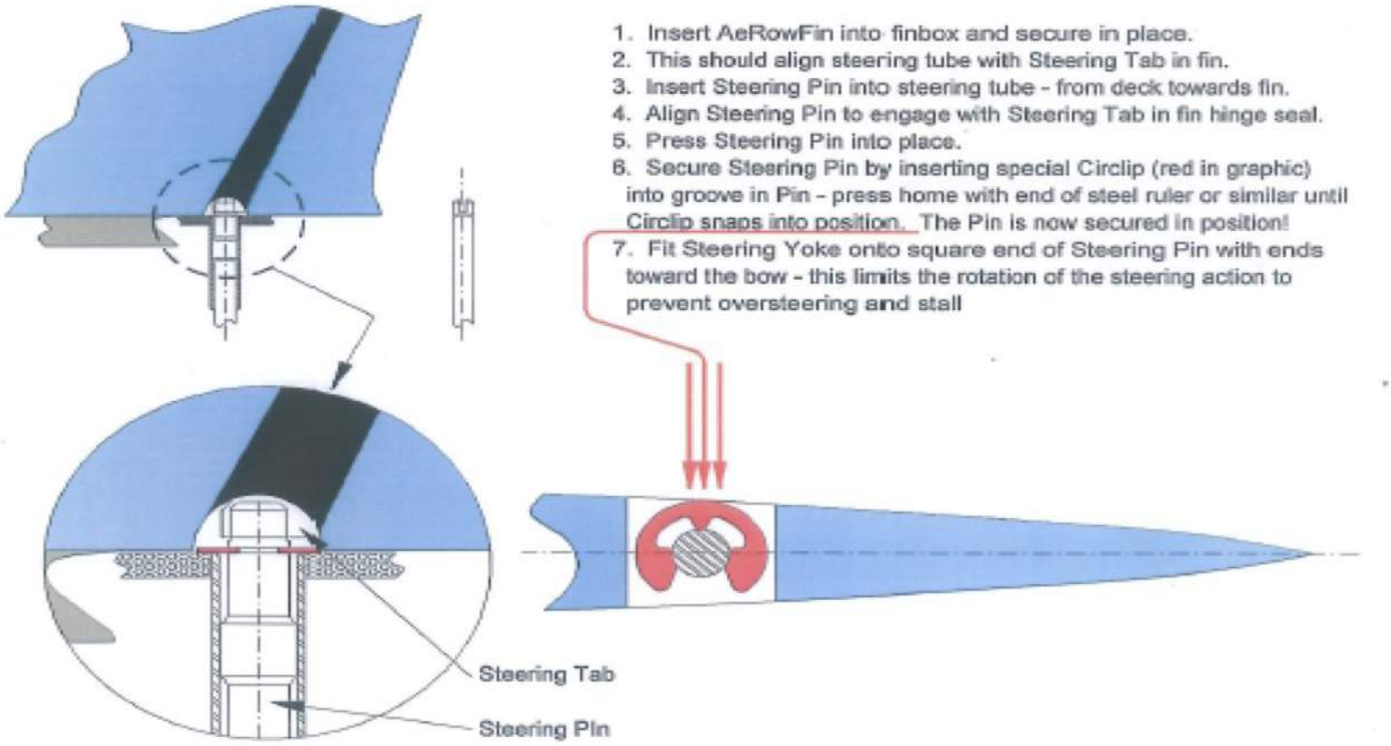
Remove the riggers by removing the screws connected to the boat.
Remove the pin, the hilt and remove the oarlock with the washers from the pin.
Remove the M8 screw and remove component 'A'.
Clean all components with a neutral degreaser and if necessary, remove the deposits or residues of salt or calcium using a calcium removal product.
Lubricate the threads with lithium-based marine grease.
Reassemble the parts.
Maintenance operations must be performed monthly.

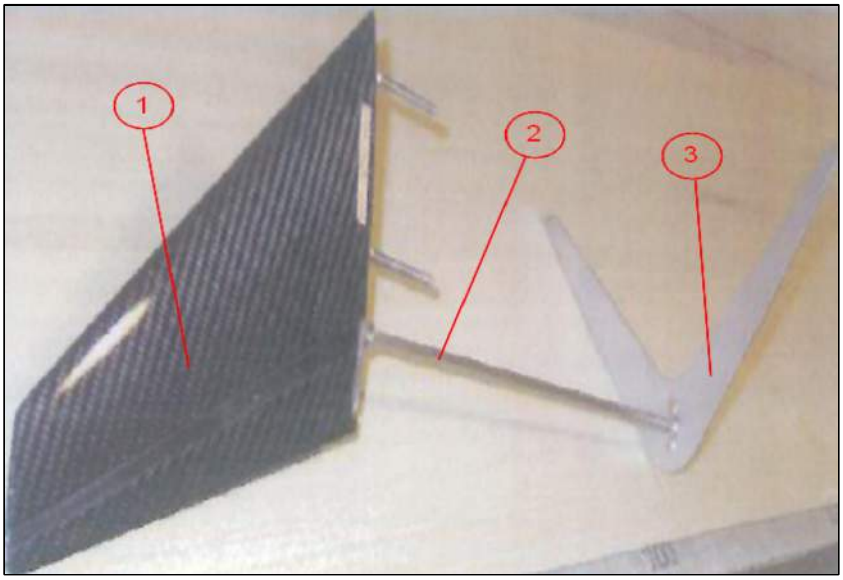
Warning:
The guarantee is valid only if correct maintenance procedures are performed!

Tools required:

- **10mm spanner**
- **2x13mm spanners**
- **no. 4 Allen key**
- **no. 5 Allen key**
- **no. 6 Allen key**
- **Measuring tape**
- **Pitch meter**
- **Height measure stick**

FIN AeRowFin





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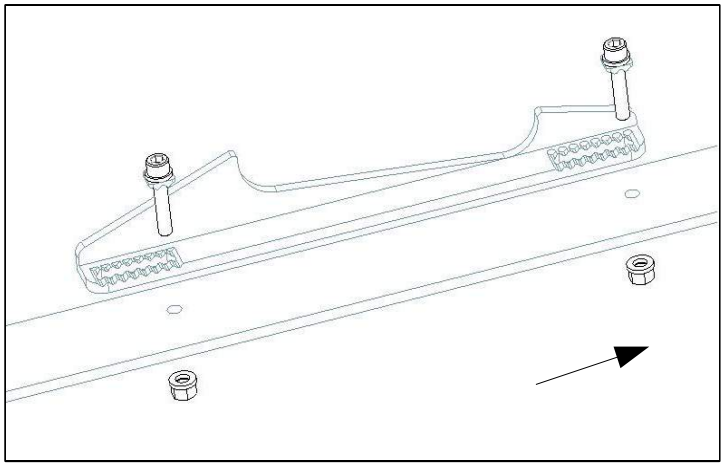
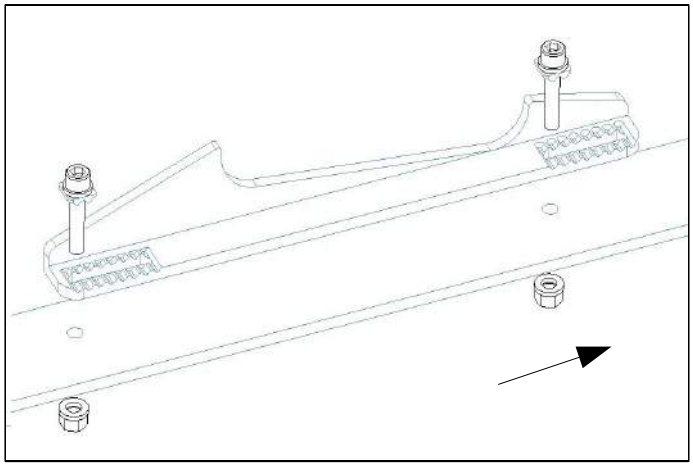
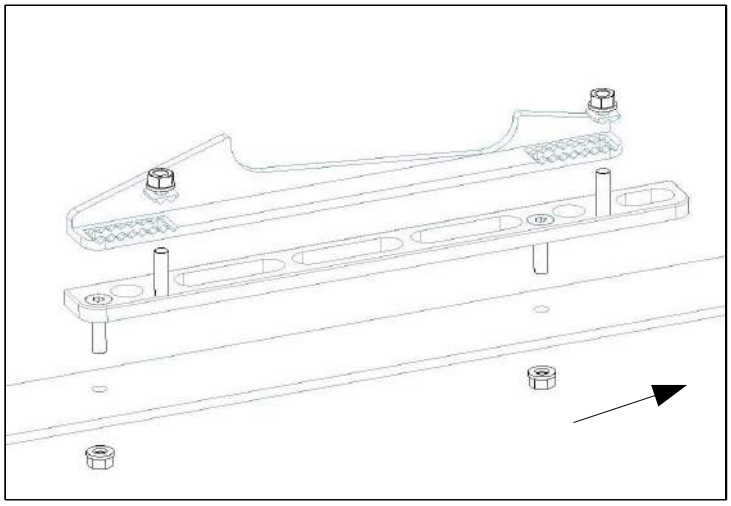
MULTIADJUSTMENT FOOT-RIGGER

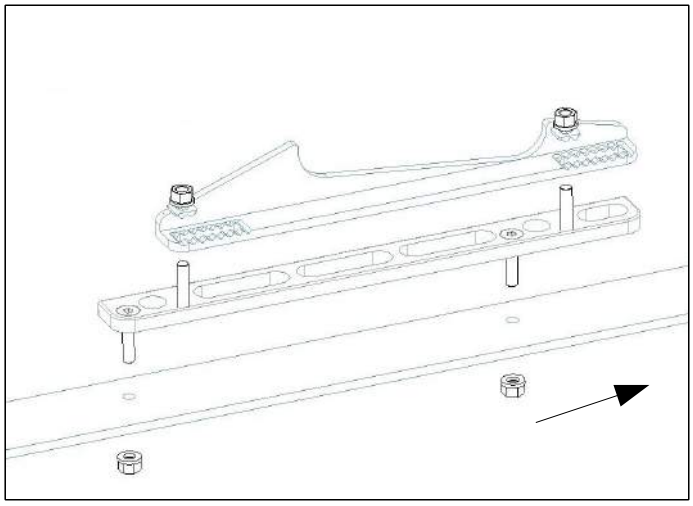
This foot is useful when it is needed a most accurate adjustment. It is possible to set the rigger with step of 5mm.
Look at the pictures below to see some setting examples:





To increase the distance from zero-line it is necessary to fit the adapter on each foot.





It is not possible to fix the adapter on rigger not designed for!

Tools required:

- 2x10mm spanners
- no. 4 Allen key

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SLAT FIN for 2-, 4 , 8+

Removal

1. Place the boat on the trestles, and for those boats with the yoke inside the stern bulkhead, open the hatch on the rear deck.

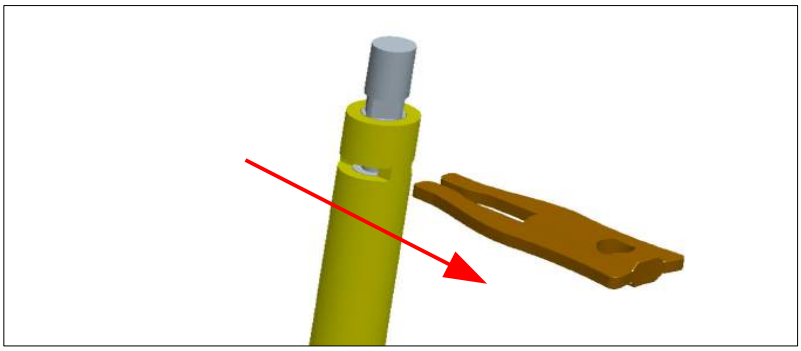
2. Work inside, loosening the nut on the top axis of the rudder (10mm) and remove the control lever.

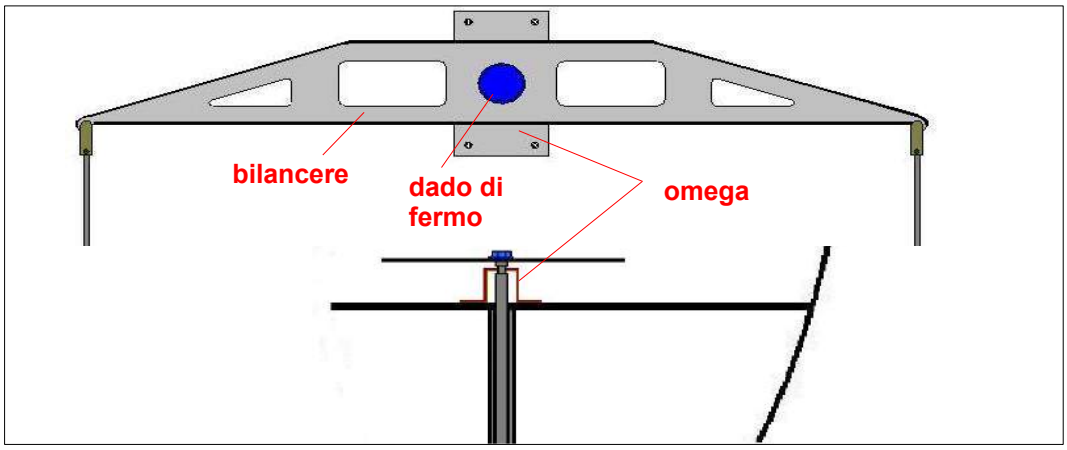
Warning: The rudder cables form an "X", so be careful not to make the control lever rotate, which could reverse the rotation direction of the rudder or make the control too rigid.

3. Rudder shaft removal:

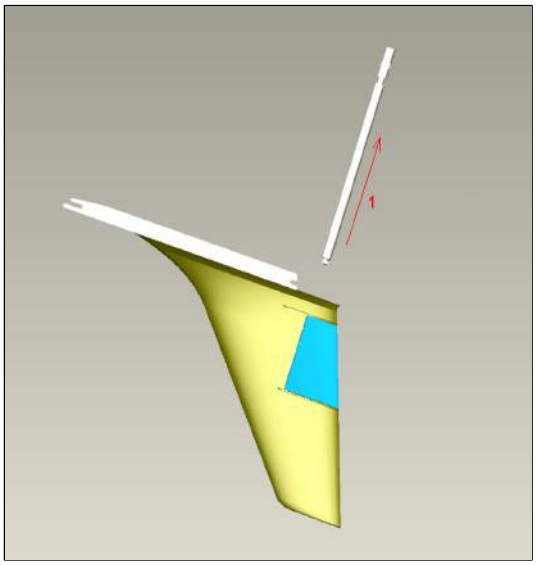
- Remove the rudder-lock or, depending on the version, remove the retainer bracket ("omega" shape) of the rudder shaft turning the screws of the seal (see figure 1 or figure 2)

- Remove the rudder shaft by pulling it upward (figure 3)





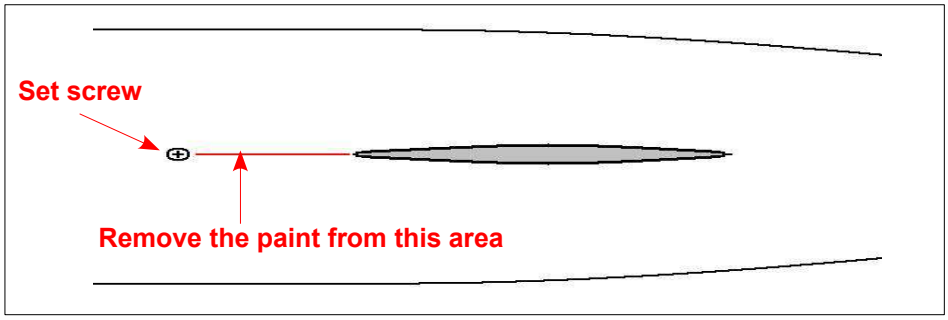
Traditional Mounting



4. Place the hull with the keel upwards

5. Remove the set screw located in front of the fin near the bow

6. Use a screwdriver to remove the paint from the set screw and the fin and the part inserted in the mast step.

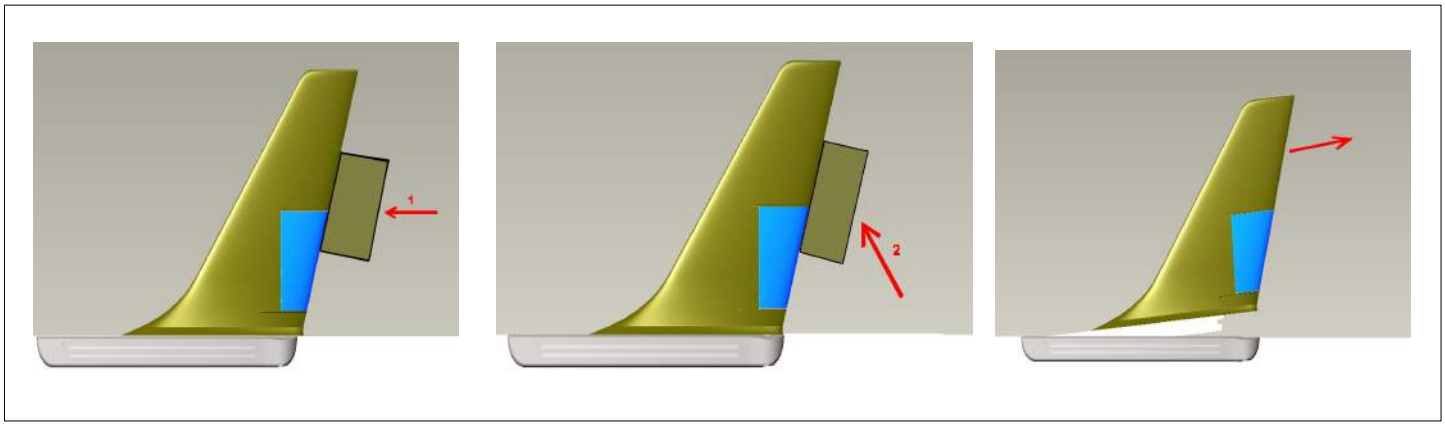


7. Keep a block of wood or teflon on the trailing edge of the fin in area next to the hull (figure 4 - drawing 1)

8. Gently with a hammer tap on the Teflon, making the fin slide about 1 cm towards the bow and extract the rudder (Figure 4 - drawing 2)

9. Then lift the back of the fin a few degrees and pull aft (figure 4 - drawing 3)

During the removal and assembly of the fin, be careful to support it with a hand in the correct position for insertion and extraction and to use the right amount of force on the fin in the direction of the arrows so as not to damage the interlocking fork of the mast step.

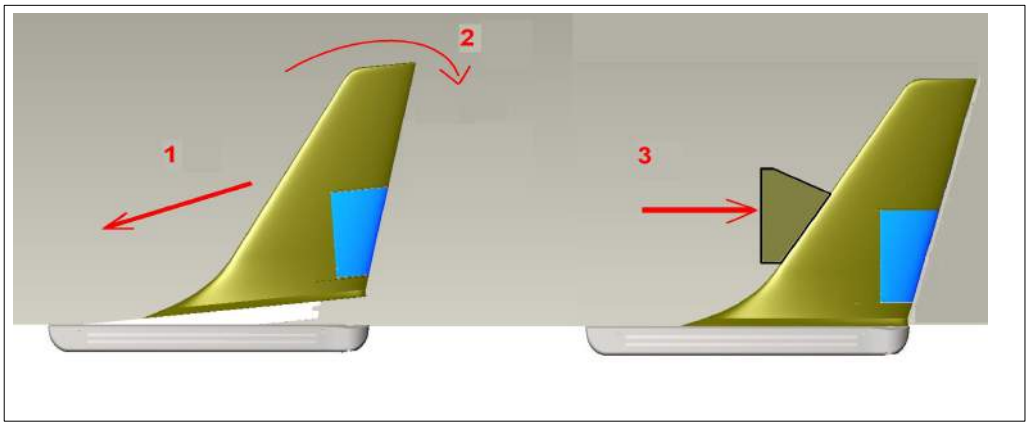


Assembly

1. Place the boat on two trestles with the keel upwards.

2. Reverse the dismantling procedure, placing the front of the fin in the mast step so as to hook it to the pin. (direction 1 Fig.5).

3. Rotate the fin to insert it into the mast step (dir. 2 Fig.5).



Make sure that the rear pin aligns with the joint cavity (Dotted line) and on the fin use force precisely in the direction of the arrow so as not to damage the rear interlocking fork for the mast step.

4. Tap gently with a hammer to fasten the rear interlocking fork of the fin to the locking pin on the mast step (always with Teflon or wood between the fin and hammer) (dir. 3 Fig. 5).

5. Turn the boat over with the keel down.

6. Insert the titanium rudder shaft from above performing small rotations to fit the shaft into the rudder slot.

7. Mount the rudder-lock in the rudder pin slot or the carbon omega (to be secured with two self-threading screws) and insert the control lever and secure it with the Ergal (aluminium alloy) self-locking nut.

Maintenance:

Clean the fin with a neutral product.
Check the condition of control cables and replace if necessary (See specifications sheet No. 6)
Remove and grease the axis of the pin with lithium-based marine grease if you experience stiffness in the lever.
Remove the fins only if necessary.
In the case where you have removed the fins, lubricate the screw threads and the surface of the fin that is inserted into the mast-step with lithium-based marine grease.
Clean the hull of the boat after reassembly.

Warning!
The guarantee is only valid when correct maintenance procedures are followed!

Tools required:

- No. 10 Allen key
- Phillips screwdriver
- Hammer
Teflon block

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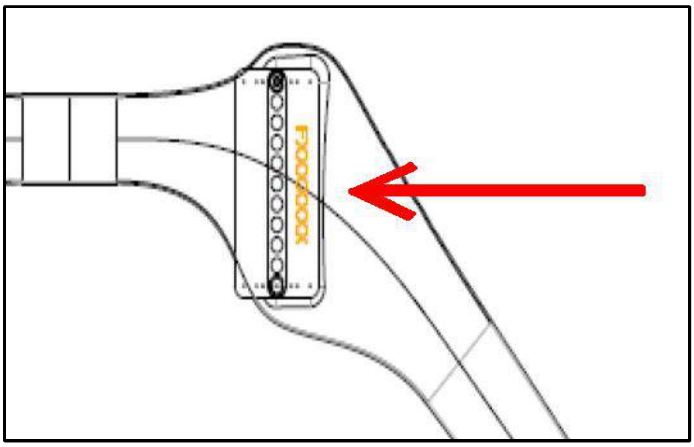
CARBON WING RIGGER 2013

Assembly



Check that the serial number on the boat corresponds to those of the riggers; pay attention to the rowing seat number indicated on each rigger during the assembly.
Place supports on gunwale, careful to match holes left and right; keep in mind that the hole indicated with a white line corresponds with the zero line. Be sure to use the same holes on both the right and left.
Install the fifth tube following the instructions in Technical specifications No.13.

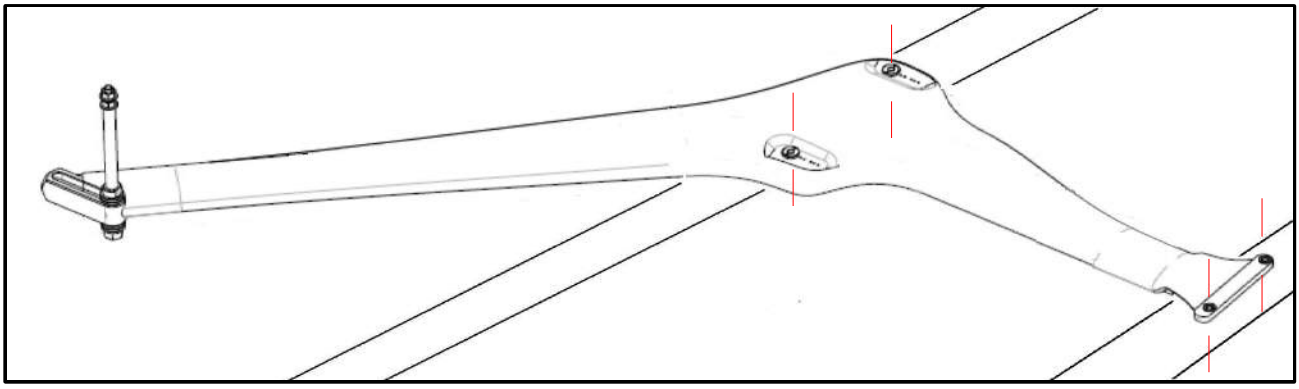
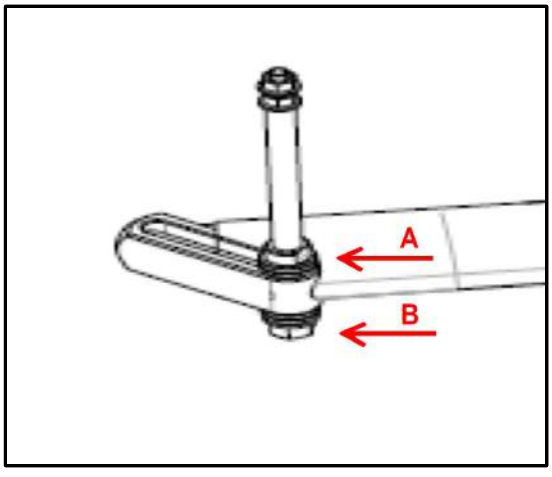


Fig. 1 Rim drilled for carbon wing rigger

Calibration



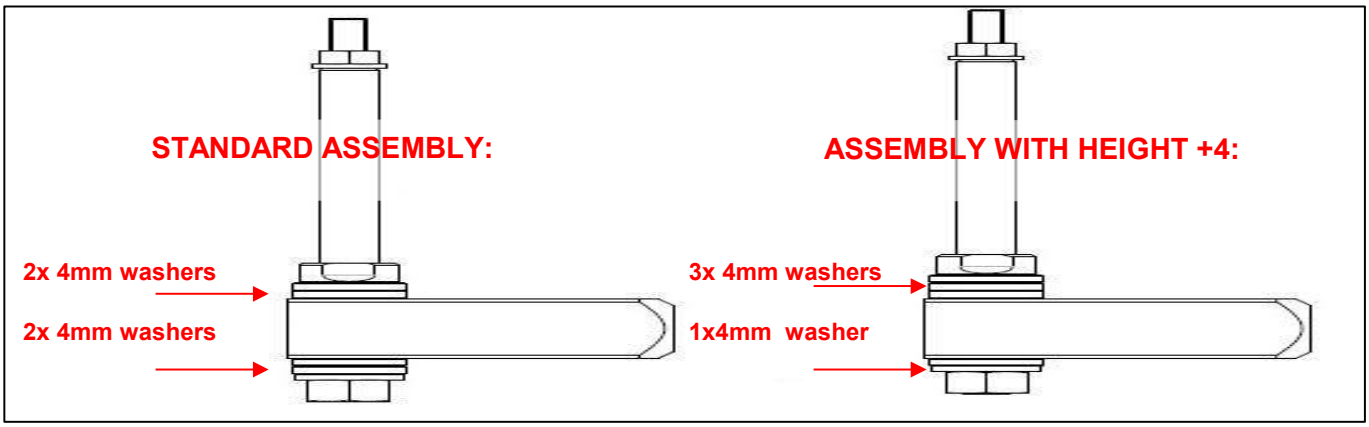
Adjust the span/spread with the help of two 19mm spanners: keep the pin still with nut 'A' and loosen 'B'.

Widen the oarlock(s) to the desired span/spread.

In the case of sculling make sure the semi-spans are equal.

Tighten the pin definitively.

• The height can be adjusted by inserting 2mm PVC washers and those in 4mm aluminum. For greater increases you can request padding components to place between the gunwale and rigger supports.



• The distance from the zero line can be adjusted by simply moving the rigger backward or forward in the holes of the gunwale; bear in mind that each step is an advancement of 20 mm.

Always take care to use the same holes on the right or left.

• To vary the lateral inclination of the pin, use the special washers as indicated in the technical specifications page No. 19.

For a correct measurement of the spread or height, see the technical specifications page (No. 9)

Maintenance

It important, to ensure maximum efficiency of the boat, to maintain all the parts both before storage and during use.
Remove the riggers by removing the nuts connected to the boat.
Remove the fifth tube and maintain it according to technical specification sheet No. 13.
Remove the pin.
Remove the oarlock and washers from the pin.
Clean all components with neutral degreaser.
If necessary remove salt and calcium deposits or residue using a calcium removal product.
Lightly grease sides with melted petroleum jelly or lithium-based marine grease
Reassemble the parts.
This maintenance should be performed monthly.

Tools required:

- 10mm spanner
- 13mm spanner
- 17mm spanner
- 19mm spanner
- n°4 Allen key
- n°5 Allen key
- Measuring tape
- Oar adjuster
- Height measure stick
- backstay tools

Warning:
The guarantee is valid only if correct maintenance procedures are performed!

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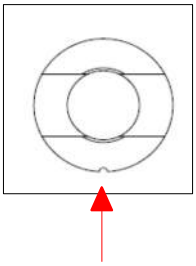
WASHERS FOR LONGITUDINAL ADJUSTMENT



These are required for the longitudinal inclination (stern-bow) of the pins in the aluminum wing, carbon wing 2013 and standard tubular riggers.

Instructions

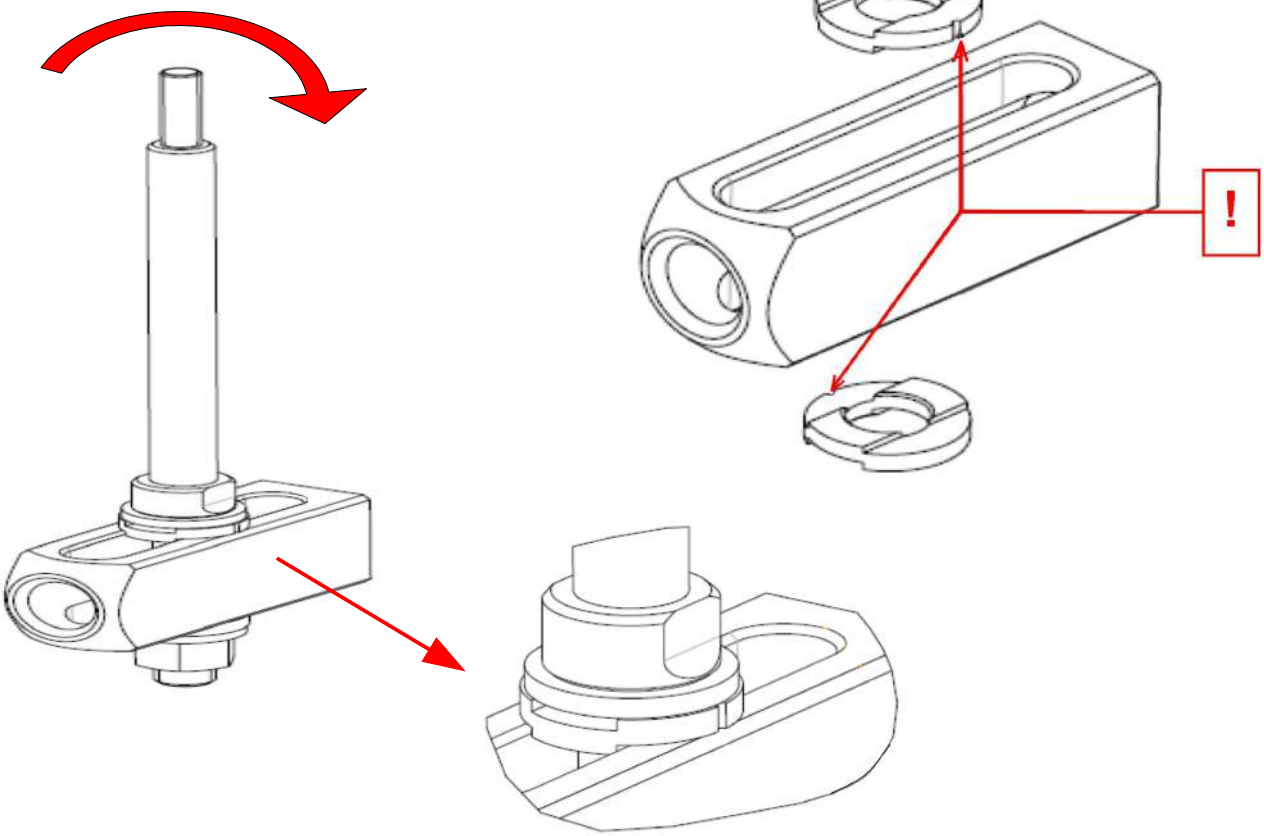
- It is necessary to install two washers on each oarlock, one on top and one on the bottom of the oarlock, positioned in opposite directions from each other.

- The prominence of the washers has to be inserted in the opening of the rigger.

- The washer sockets indicate the direction of the pin's inclination.

- To obtain an inclination towards the bow, you must place the washers on the oarlock with the sockets positioned as follows:
  1. towards the bow on the upper part;
  2. towards the stern on the lower part.

It is not possible to have an angle greater than 0.5°.



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