Laser Performance

Laser Rigging Manual

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laserperformance.com
Welcome. Congratulations on the purchase of your new Laser!

Our customers are confident that LaserPerformance means quality made. They know that we go to great lengths in both quality and service to earn that confidence. We are honored to have that support and trust.

The Laser is a very unique boat that can accommodate many different sized sailors and abilities, due to its three interchangeable rigs. The Laser, the Radial and the 4.7 all use the same hull and equipment with the exception of the lower mast and sail.

We suggest that you read through this guide to better familiarize yourself with the parts and rigging of your new boat. If you have any questions please contact your dealer or call LaserPerformance Customer Service.

This is a comprehensive rigging guide for the Laser Race and Laser XD. Please note that in our effort for continuous improvement the exact color and spec of Laser parts may vary from those in the below images.

Depending on which Laser you have selected (Laser, Radial or Laser 4.7) you will have one of the following sails and corresponding lower masts located in your delivery kit.

Locate your delivery kit. Depending on which model you have purchased there will be a few differences in some of the hardware. The differences between the three models are the cunningham, outhaul, vang and tiller extension. To avoid damaging the contents, be sure not to cut into the packaging inside the box.

Here is a list of tools that we recommend you have in order to assemble your new Laser...

- phillips head screwdriver
- silicone sealant
- white electrical tape
- utility knife
## 2. Unpacking and Preparation

**Race Delivery Kit**

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
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<tbody>
<tr>
<td>1</td>
<td>Sail numbers</td>
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<tr>
<td>2</td>
<td>Line bag</td>
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<tr>
<td>3</td>
<td>Gorilla tiller &amp; extension</td>
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<td>4</td>
<td>Rudder</td>
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<td>Lower vang block/cleat assembly</td>
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<td>12</td>
<td>Mainsheet ratchet block</td>
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<td>13</td>
<td>Spring</td>
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<td>14</td>
<td>Forkhead block base</td>
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<td>15</td>
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<td>18</td>
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<td>23</td>
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<td>24</td>
<td>Mega bolt</td>
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**XD Delivery Kit**

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<td>Line bag</td>
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<td>Carbon tiller &amp; extension</td>
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<td>4</td>
<td>Rudder</td>
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3. Parts of the Laser

**Nautical Terminology**

**Port:** Left side of the boat when looking forward

**Starboard:** Right side of the boat when looking forward

**Gunwale:** Upper edge of a boat's side

**Leeward:** Direction away from the wind

**Windward:** Direction from which the wind is coming

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### Useful knots to know

- **figure 8 or stopper knot**
- **square knot**
- **cleat**
- **bowline**
- **clove hitch**
4. Hardware Installation

Laser Race & Laser XD Models

Reminder: Before placing the screws be sure to dip them into a silicon based sealant to allow for a water-tight and secure fit.

1. Apply Silicone sealant or Sikaflex to all four pre-drilled screw holes in the deck for the block plate and the cleat base. (figure 1)

2. Fit the block plate over the existing holes using the screws provided and slowly drive into the deck. Be sure not to over-tighten the screws. (figure 2)

3. Fit the cleat base over the existing holes using the screws provided and slowly drive into the deck. Be sure not to over-tighten the screws. (figure 3)

4. Locate the ratchet block and spring from the delivery kit. In the cockpit, at the forward end of the hiking strap, locate the eyestrap.

5. Remove the shackle from the bottom of the ratchet block and place it around the eyestrap (figure 4).

6. Place the spring over the eyestrap and compress. While the spring is compressed, attach the block to the shackle with the pin and ring (figure 5).

Tip: To assist in keeping the spring compressed while attaching the block to the shackle, try compressing the spring and tie with string or zip-tie. Place the tied spring over the eyestrap and attach the block. Then untie the string/cut zip-tie to release the spring.
5. Rigging the Traveler

Alternative 1

1. Locate the traveler line and small traveler block from the delivery kit. On the stern of the boat locate the two fairleads (figure B).

2. Run one end of traveler line through the starboard fairlead (from bow to stern, figure 6), then through the small traveler block (figure 7) and continue through the port side fairlead (from stern to bow).

3. Make a loop in the port side of the line as if you were going to tie a bowline (figure 8). Keeping in mind that the free end of the port side line will be cleated off. Take the starboard end of the line and complete the bowline by going through the port loop (figure 9).

4. Continue the tail end of the port side line through the cleat and tie off with a bowline handle (figure 10).
5. Rigging the Traveler

Alternative 2

1. Locate the traveler line and small traveler block from the delivery kit. On the stern of the boat locate the two fairleads (figure C).

2. Run one end of traveler line through the starboard fairlead (from bow to stern, figure 11), then through the small traveler block and continue through the port side fairlead (from stern to bow). (figure 12)

3. Tie a bowline in the port side of the traveler line (figure 13). Lead the starboard end of the line through the bowline and pull until snug (figure 14).

4. With the starboard end of the line tie an overhand knot to secure the line (figure 15).

5. With the tail end of the line, lead it through the cleat and tie off with a bowline handle (figure 16).

Note: These are the two manufacturer-suggested methods for rigging your traveler. Many other methods exist. Ask around, experiment and find the method you enjoy most!

Taping Traveler Blocks: It is recommended that you tape the traveler block brummels so that they do not become twisted or disconnected when sailing.
6. Rigging the Mast

Laser 4.7 and Laser Radial

1. Locate the sail, battens, boom, upper and lower mast from your delivery kit. Remove your sail from the sail bag and have the three battens handy. Your battens should comprise of: Two long and one short (figure 17).

**Tip:** When unfolding sail, make sure that the area is free of sharp objects that could damage the sail! To ensure the batten tips do not fall off inside the pocket when the battens are removed, it is suggested that you tape the batten tips.

2. Unfold the sail. Starting from the head of the sail locate the top batten pocket. Insert the smallest of the three battens into the top batten pocket (figure 18).

3. Insert the battens so that the curved end is inserted first. When inserting the batten into the pocket, you will be applying pressure against elastic located in the end of the pocket. As you press against the elastic, slide the batten in and down so that the tip rests in the closed end of the pocket (figure 19). To remove: press the end into the elastic, and slide the tip to the open end of the pocket.

4. Continue down the sail, inserting the two remaining battens.

**Note:** Before folding the sail make sure to remove the battens.

5. Slide the top section of the mast into the lower section until the top sections plastic collar is snug against the aluminum of the lower section. Make sure arrows line up.

6. Find the opening in the sail sleeve located at the foot of the sail (figure 20). Slide the sleeve of the sail over the mast, aligning the cunningham grommet with the gooseneck and removing any twists in the sleeve.

**Tip:** The head of the sail does not rotate easily on the masthead, so it is suggested to align the head of the sail with the gooseneck before stepping the mast.
6. Rigging the Mast

Laser Race and Laser XD

1. Locate the Laser Mark II sail, tapered battens, boom, upper and lower mast from your delivery kit. Remove your sail from the sail bag and have the three battens handy. Your battens should comprise of: 1 short (top), 1 medium (middle) and 1 long (bottom). (figure 21).

**Tip:** When unfolding sail, make sure that the area is free of sharp objects that could damage the sail! To ensure the batten tips do not fall off inside the pocket when the battens are removed, it is suggested that you tape the batten tips.

2. Unfold the sail. Starting from the head of the sail locate the top batten pocket. Open the Velcro enclosure straps to expose the batten pocket. (figure 22)

Insert the shortest of the three battens into the top batten pocket. (figure 23)

3. Insert the battens so that the tapered end is inserted first. When inserting the batten into the pocket, you will be applying pressure to the non-tapered batten end. Lift of outer Velcro strap over the batten pocket and press firmly down. (figure 24)

Secure with the inner Velcro strap and press firmly down to complete. (figure 25)

4. Continue down the sail, inserting the two remaining battens.

**Note:** Before folding the sail make sure to remove the battens.

5. Slide the top section of the mast into the lower section until the top sections plastic collar is snug against the aluminum of the lower section. Make sure arrows line up. (figure 26)

6. Find the opening in the sail sleeve located at the foot of the sail. Slide the sleeve of the sail over the mast, aligning the cunningham grommet with the gooseneck and removing any twists in the sleeve. (figure 27)

**Tip:** The head of the sail does not rotate easily on the masthead, so it is suggested to align the head of the sail with the gooseneck before stepping the mast (figure 30a).
7. Stepping the Mast

1. Make sure the bow of the boat is pointing into the wind and that there are no overhead electrical wires in the area! Also make sure that the mast step hole and mast butt are perfectly clean; any sand or dirt in the mast step will grind into the gelcoat and can damage the mast step.

**Warning:** The mast is metal and is an electrical conductor. Contact with overhead electric wires could be fatal, please exercise extreme caution when raising the mast, launching and sailing.

2. Place the mast butt against a flat solid object. By placing a towel or piece of cardboard on the ground it will help prolong the life of the plastic mast butt.

3. Lift the mast from the head of the sail and walk toward the mast butt, raising the mast hand over hand until vertical.

4. Make sure that the gooseneck is facing the stern of the boat before lifting.

5. Keeping your hands a good distance apart, lift the mast over the mast step hole (figure 28).

6. Allow the mast to carefully slide down into the step. Do not drop the mast into the step for it will cause damage!

7. Remove any wraps in the sail sleeve.

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**Attaching the Boom**

1. Before attaching the boom locate theouthaul line from the delivery kit line bag. Insert the gooseneck pin into the forward end of the boom and walk aft, exerting pressure towards the mast, to keep it in place (figure 29).
8. Rigging the Outhaul

Laser XD Models

1. Take an outhaul single block and secure a bowline loop with the outhaul block tie line. Take the loose end and secure a bowline loop around the mast, immediately above the gooseneck. (figure 30)

2. Take the outhaul primary line and tie a bowline to the outhaul fairlead at the aft end of the boom. (figure 31)

3. Pass the block tie line through the single block and attach to the bridge of the boom cleat using a reef knot. (figure 32)

4. Pass the block tie line through the single block and attach to the clew of the sail using a reef knot. (figure 33)

5. Take the loose end of the outhaul primary line and pass through the clew block (figure 34) before passing it back around the outhaul fairlead. (figure 35)

6. Pass through a single block and finish with a bowline. (figure 36)

7. Take the outhaul control line and pass through the port deck turning block. Continue by feeding the outhaul control line upwards, through the block tied at the gooseneck and aft along the boom. (figure 37)

8. Pass through the aft fairlead block, (figures 38 & 39), pass forward through the cleat block (figure 40) and continue to pass aft through the center of the single fairlead block and tie off with a bowline. (figure 41)
8. Rigging the Outhaul

Laser XD Models

9. Take loose end of the outhaul control line and pass through the port deck cleat base (figure 42), before tying a bowline loop handle in its end. (figure 43)

10. With the outhaul pulled tight, fit the clew strap around the sail clew and boom. (figure 44)

11. The strap should be tightened sufficiently and the Velcro secured so the clew of the sail is relatively close to the boom. (figure 45)

12. Take the outhaul elastic line and feed it through the integral webbing loop in the clew strap before tying a double overhand stopper knot in its aft facing end. (figure 46)

13. Pass the remaining loose end of the outhaul elastic forward through the boom cleat before tying a double overhand stopper knot. (figure 47)

14. The clew strap should be able to slide fore-and-aft when adjusting the outhaul.
9. Rigging the Cunningham

Laser XD Models

1. Take the cunningham block tie line and secure one end with the cunningham single block using a bowline.

2. Take the loose end and secure a bowline loop around the mast immediately below the vang tang. (figure 48)

3. Take the primary Cunningham line and tie a bowline around the pin located at the top of the vang base unit. (figure 49)

4. Feed the primary line up through the clew of the sail from port to starboard. (figure 50)

5. Take the loose end of the primary Cunningham line and feed through the large primary Cunningham block and secure with a bowline. (figure 51)

6. Take the one end of the Cunningham control line and tie a bowline through the center of the large primary cunningham block. (figure 52)

7. Feed the control line down through the secondary cunningham single block (figure 53), back up through the large primary block (figure 54) and back down through the starboard side base turning block (figure 55), and finally through the starboard side base cleat. (figure 56)

8. Take the remaining loose end and tie off to form a rope handle. (figure 57)
10. Rigging the Vang

Laser XD Models

1. Position the stainless steel top block key in the keyway on the underside of the boom. (figure 58)

2. You can apply tape around the boom to secure the block key from disengaging. (figure 59)

3. Remove the ring and pin and attach the vang base unit to the mast. (figure 60)

4. Tie the vang primary line around becket of the stainless steel top block using a bowline. (figure 61)

5. Pass the loose end of the vang primary line downward through the base unit pulley from top to bottom. (figure 62)

6. Pass the vang primary line back up to the top block threading it from back to front. (figure 63)

7. Tie the vang primary line on to the double block using a bowline. (figure 64)

8. Take the vang control line and thread it through the base unit cleat towards the mast.

9. Pass through the fairlead and under bottom integral block. (figure 65)

10. Pass back through the base, over the bottom block, directly under the pair of integral horizontal blocks. (figure 66)
10. Rigging the Vang
Laser XD Models

11. Take the loose end of the vang control line and pass it around the bottom of the floating double block from port to starboard.

12. Pass down through the bottom of the base horizontal block from starboard to port. (figure 67)

13. Pass up around the top of the floating double block from port to starboard. (figure 68)

14. Pass down through the top of the base horizontal block from starboard to port. (figure 69)

15. Pass up through the center of the floating double block and secure with a bowline. (figure 70)

16. Feed the remaining loose end of the vang control line (purple/white) through the plastic handle to form a loop by tying a bowline at its base. Effectively this handle acts as a vang stopper which should be positioned at your maximum vang ease setting. (figure 71)

17. Take the remaining loose end and tie off to form a rope handle. (figure 72)

11. Mast Retaining Line

1. Take the one end of the mast retaining line and tie a figure 8 stopper knot. (figure 73)

2. Pass the loose end through the port eye of the block plate from starboard to port. (figure 74)

3. Tie a bowline loop to act as a fairlead for the dagger board retaining elastic. (figure 75)

4. Pass the loose end up and around the vang tang securing with a bowline. (figure 76)
12. Mainsheet

Laser XD Models

1. Take the mainsheet through the becket of the boom end block and tie a stopper knot. (figure 77)

2. Lead the line down through the large traveler block going aft (figure 78), and back up through the boom-end block. (figure 79)

3. Continue the line forward towards the mast through the boom webbing sling (figure 80), through the forward boom block (figure 81), and down to the ratchet block. (figure 82)

4. Lead the line through the ratchet block making sure you hear a ratcheting noise when trimming in the sail.

5. Take the loose end of the mainsheet and tie to the hiking strap with a bowline (figure 83), making sure the mainsheet is clear of any knots. (figure 84)
13. Daggerboard Retaining Line

Laser XD Models

1. Take one end of the elastic and tie a bowline to the bow eye. (figure 85)

2. Lead the free end aft and through the mast retainer fairlead. (figure 86)

3. Feed loose end through the plastic snap hook and secure with a stopper knot. (figure 87)

4. Tie a short line loop through the daggerboard using a reef knot (figure 88), and clip the plastic snap hook on it. (figure 89)
14. Rudder and Tiller

Laser XD Models

1. Remove the safety ring from the top pintle. (figure 90)

2. Align the pintles over the gudgeons and press down to secure. (figure 91)

3. Once the rudder is secure in place, attach the safety ring to the top pintle. (figure 92)

4. Slide the tiller with extension under the aft traveler line and insert through the rudder head. (figure 93)

5. With the rudder in the upright position, take the rudder downhaul line and feed through the tiller cleat. (figure 94)

6. Tie a figure 8 stopper knot to the loose end of the rudder downhaul line. (figure 95)

7. When you are ready to sail, pull on the rudder downhaul; the rudder blade will lower into the water.

8. Tighten the line through the tiller cleat and secure with half hitches. (figure 96)

9. Check that the stern plug and bailer plug are securely in place. (figures 97 & 98)
15. Sail Number Application

Laser Race and Laser XD Models

Provided in the delivery kit are 4 red and 8 blue or black sail numbers. In order to participate in Laser regattas you will need to apply the numbers to your sail for easy identification. Identify Sail number from the sail number plaque in the cockpit. Cut each sail number from Digital “8’s” supplied:

Laser 4.7

Laser MKI

Laser Radial

Laser MKII
16. Installation of Optional Mainsheet Cleats

Laser Race and Laser XD Models

These cleats come with your boat as part of your parts bag. We don’t install them at the factory because not everyone likes to sail with them.

1. Position the side cleat so that the center of the jaws are in line with the end of the grabrail and the screw holes are on the edge of the non-skid deck. (figure 100).

2. Spot mark the holes with a 2.5mm drill using the cleat as a guide. Remove cleat (figure 101).

3. Drill screw holes with a 2.5mm drill (figure 102).

4. Apply silicone sealant or sikka flex to the holes to avoid leaking (figure 103).

5. Screw the cleat to the deck so that the jaws open outboard. Screws = 4.2mm dia. x 38mm (figure 104).

6. Check that the jaws open and close easily. Over tightening can cause the cleat jaws to jam.

Seitech Dollies

SEITECH dollies are the easy-to-use, light-weight, small boat transportation solution. The Laser dolly has been designed specifically to fit and support the shape of the hull. Special features of the Laser dolly include a rounded bow support for secure transportation and gunwale supports for proper storage. SEITECH dollies allow you to spend less time getting your boat to and from the water and more time on the water.

laserperformance.com
17. Care, Maintenance and Service
Before rigging read and familiarize yourself with the rigging manual. Failure to adhere to these guidelines could invalidate your warranty.

Maintenance
- Keep the equipment clean by frequently flushing with fresh water. In corrosive atmospheres, stainless parts may show discoloration/brown staining around screw holes and rivets. This is not serious and can be removed with a fine abrasive.
- Excess water should be removed from the hull.
- Ropes, rigging and fittings should be checked at regular intervals for wear and tear, including winch gear.
- All moving parts should be lightly lubricated to avoid jamming, i.e., McLube, dry Teflon or a dry silicone based spray. Do not use oil.
- Inspect shackles, pins and clevis rings and tape up to stop snagging sails, ropes and clothing and to prevent them from coming undone.
- When refastening screws do not over tighten as this may strip the thread and do not reuse Nyloc nuts more than three times.
- Damaged or worn parts should be replaced.
- Sails should be thoroughly washed down with fresh water, dried and stored in a dry place.

Trailers and Trolleys/Dollies
- It is highly recommended that a trolley/dolly is used to launch and recover your boat. Dragging your hull up onto a beach or slip way will wear away the gel coat or polyethylene and damage the boat. Also, the hull should not be left on a pebble beach as the hull skin could be dented.
- Trailers should be rinsed with fresh water and checked at regular intervals. It is recommended that trailers be serviced annually. The trailer and road base should never be immersed in water.
- Trailers and trolleys supplied by LaserPerformance are designed to transport the hull in the best possible manner to avoid damaging the hull. For instance LaserPerformance does not recommend supporting hulls on rollers except on the keel line and only where there is a reinforced keelson. We also recommend gunwale hung trolleys for our smaller products. Hulls supported by a trolley bunk or wide strap must have the ability to drain water away from the hull. Trolley bunks padded with carpet or foam can cause blistering in the gelcoat and changes to the hull color. Please do not transport your LaserPerformance product on a trailer or trolley that has not been specifically designed for the product. Hulls damaged through using an incorrectly designed or wrongly set up trailer or trolley are not covered under warranty.
- When securing your boat to a trailer for transport be very careful that ratchet straps and ropes are not over tightened and that there is sufficient padding under the strap or rope to prevent the hull/deck from being damaged through abrasion or pressure.
- Top covers must not be allowed to “flap” when driving at speed. This can abrade the surface of the hull and damage it. It is recommended if you are towing and plan to use your top cover that an under cover is fitted first to prevent cover flap damage to the top sides of the hull.
- Repairs to the polyethylene or GRP hulls should be undertaken by persons with the relevant equipment and skills. contact LaserPerformance for advice.

Storage
- Your boat should always be tied down securely to the ground when not in use.
- UV light will cause fading to some components and fittings. A cover is recommended to reduce the UV degradation.
- Do not leave the rig under tension when not sailing or during storage.
- Care must be taken to support the hull adequately if storing on racking or similar. Any sustained point loading could permanently dent or distort the hull.
- Under covers for LaserPerformance products should be produced from a breathable or semi breathable fabric to allow moisture to evaporate away from the hull. This is essential to prevent damage to the hull skin. Also, the hull should never be left in the under cover wet or damp. A combination of moisture and heat over an extended period can also damage the hull. The under cover is designed to protect the hull when being transported and should be removed when the hull is being stored. Typical damage includes small bubbles or blisters, excessive print through of gel reinforcement, foam or wood and color change.
- Rudders and centerboards must never be stored wet in carry/combo bags. This can cause blistering, print through and warpage.
- All our GRP products are designed to be dry sailed. In other words stored on dry land. If you intend to leave your boat on a mooring for any length of time it is essential that you apply an osmosis barrier coat. LaserPerformance can recommend a suitable product.

On Water Towing
- Towing your LaserPerformance product at high speed (10 – 20 knots) behind a rib or power boat can seriously damage the hull. Boats damaged in this manner are not covered by the warranty. LaserPerformance recommends a maximum towing speed of 6 knots.
18. Examination Report

This is to certify that the product listed below conforms to the requirements of the
Recreational Craft and Personal Watercraft Directive

Certificate Number: HPiVS/F1179-001-I-01
Date of Issue: 31-May-2017
Manufacturer: Laser Performance (Europe) Ltd.
Station Works
Long Buckby
NN6 7PF
United Kingdom

Product Description: Laser, Laser Radial & Laser 4.7

Description of Product: Sailing dinghy with rigid hull

Design Category: C
Number of hulls: 1

Length (m): 4.21
Hull (Lh): 4.21
Max. (Lmax): 1.37
Hull (B): 1.37

Maximum Load: People: 2
Mass (kg): 175
Light Craft: 81
Max. (M,dc): 256

This report confirms that HPiVS have assessed the craft against ER 3.2 ‘Stability’ & 3.3 ‘Rotation’. The manufacturer is responsible for compiling Technical Documentation for all the other requirements.

Managing Director

Technical Manager

This certificate is supported by a report bearing the same certificate number.
This certificate is the property of HPi Verification Services Ltd. & may not be amended or issued to others.
The manufacturer must inform HPi Verification Services of any changes that affect any of the assessed Essential Requirements. Failure to do this will invalidate the Certificate.
The applied conformity assessment module does NOT allow the client to affix the Notified Body’s identification number on the product.