



Glide Free Foils - Operating Instructions

Quick Start Instructions:

For those impatient souls who do not want to read the 'heavy' stuff below:

- 1) Insert the centrebase insert and attach the gear block with the toggle pin from starboard side.
- 2) Add packers under the gear block to suit, screw and glue them in place. (initial setup only)
- 3) Clip on the rudder assembly. ***Always** attach the thrust washer with retaining clip.
- 4) Tip the boat over in the water and insert the centreboard from underneath, top angled forward.
- 5) ***Always** attach the centreboard safety clip through the keyhole before leaving the beach.
- 6) Lower and tightly secure the rudder down with the locking pin when leaving the beach.
- 7) Push the centreboard board fully down and pull back to engage, then wrap the shockcord tightly back around the pin.

.....Sail away and experience the thrill of foiling!!



Glide Free Foiling Laser dinghy on Sydney Harbour, full rig.

Now some very helpful details for those more careful people who wish to do it right and avoid mistakes...



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Introduction

Glide Free Design aims to provide everyone who can sail a dinghy, the opportunity to experience the thrill of foiling. Just as the first windsurfers were so popular reaching back and forth in a nice breeze for the pure fun of it! We have chosen to apply our foils to the Laser dinghy because it is by far the most popular single handed sailing dinghy, it is relatively simple and cheap, and yet has sufficient power to enable fun foiling.

To make foiling simple, practical and fun, we needed to address the many limitations of today's foiling dinghies. We have not just copied what has been done before, but have developed a completely new foiling system with flapless foils and integral wand which enables many unique design features not previously available. This has resulted in easy launching in shallow water, safe, efficient and fast foiling, along with good non-foiling light wind performance.



Glide Free Foils on a Laser Radial upwind in 12-15kts

Application of Glide Free foils to a standard Laser hull has been achieved without any alterations, or fastenings. A simple toggle pin is used to attach the foils, which are strong, stiff & robust employing simple materials at a reasonable cost. At the same time we have achieved a more stable boat which is easier to sail and right after capsize, with a lighter helm and an impressive turn of speed.

Sure, with double the weight, half the beam and a smaller sail you could never expect a Laser to perform as well as a foiling Moth. Takeoff will always be on a reach, but we think you will be impressed with what you can achieve once you are up and going!! Surprisingly, Lasers are a pretty good foiling platform, as they actually have low wind drag, which at 20kts makes up around half the total resistance. Lasers are stable and easy to sail in all conditions and very forgiving.

We wish you many pleasureable hours of fun on your foiling Laser.



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Foiling for the first time

Foiling dinghies provide a thrill unlike other forms of sailing. Managing the speed and acceleration is not a natural reaction, even for experienced traditional dinghy sailors. Upgrading your Laser with foils is akin to moving from a Dinghy to a Sailboard, it is not something that everyone can master at their first attempt.

Initially you may only be able to foil successfully downwind. This is just like dinghy sailing with a spinnaker for the downhill ride. You may initially need to sail in displacement mode upwind before lifting off to fly for fun downwind. With a little experience you will start foiling very fast across the breeze like a sailboard, and finally with you may even be able to master fast upwind sailing.

To manage a sailboard for the first time usually takes a few days of practice, persistence and even professional instruction. With a foiling Laser you need to learn how to take off and then stay upright. You will perhaps for the first time experience true 'apparent wind' sailing and will be on the edge of control. You will need to be patient and very persistent to get it right... but you will be well rewarded!!



Fun foiling on your Laser with Glide Free Foils

Incredibly, Glide Free foils supercharge your Laser and require a matching level of skill to master. Foiling is certainly not for the novice or feint hearted sailor. As the boat lifts and takes off, it accelerates very quickly and the apparent wind moves ahead, luffing the sail and providing drag. If you do nothing or do not react quickly enough, the boat will fly high and then crash, fall in to windward or both!! A little embarrassing and perhaps frustrating until you learn to bear away and sheet on quickly. Trimming, leaning and steering in the right proportions is absolutely essential.

Be aware that you should first start in moderate, steady winds on an open bay without too much traffic. Even stopping requires some special skill! Don't bother to go out in winds below 10kts, this may only serve to frustrate you as you really need a decent puff of wind to lift off, although once up and foiling at speed you can continue to foil through lulls and patches of lighter air.



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Glide Free Design provides you with the equipment to experience foiling on your Laser, but cannot train you. That is something you have to do yourself. We supply documentation and instructional videos, but we cannot turn you into a master foiler... that is up to you!

Your new Glide Free Laser foils

Inspection

Check everything is in the package when delivered and first opened, referring to the parts list attached. Let us know if any parts did not arrive.



Fig 1 Centreboard with integral wand



Fig 2 Centreboard lifting foil with Spitfire wingtips



Fig 3 Rudder blade and stock assembly



Fig 4. Rudder horizontal foil

Fig 5. Carry bags



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Fig 4 Centreboard case insert GF091



Fig 5 Gearblock assembly GF007



Fig 6 Safety clip GF024



Fig 7 Washer set for rudder GF008



Fig 8 Packer set for gearblock GF090



Fig 9 Delta Speed foil wing tip

Assembly

The first task is to assemble and fit the centre case insert GF091 and gear block GF007.

Firstly, tip your boat on its side on the trolley and insert the Glide Free centre case insert from the underside as shown in Figure 9. If you are alone, it helps to put the lower mast section in the mast step and use this to hold the boat on its side. Take care to inspect your centre case as some Laser centre cases may have obstructions such as resin left over from manufacture, which needs to be cleared. Be careful to slide the insert forward edge first and push it firmly into place with a hit from your hand. Tip the boat back upright and pull the insert up tight from above.

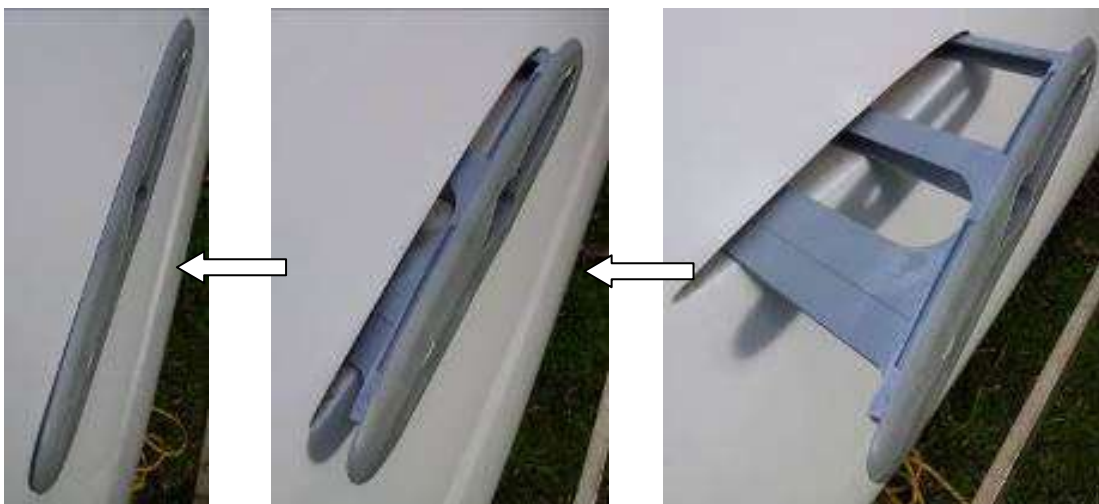


Fig 9 Push the centre case insert into the underside of the Laser centre case. GF091



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Fit the gear block over the top of the centrecase insert as shown in Figure 10 and insert the toggle pin always from the starboard side. There will normally be a gap between the underside of the gear block and the deck. Pull the centrecase up hard against the underside of the boat, one way to do this is to place a block under boat to push the centrecase insert up into the case.



Measure the gap under the gear block and choose the appropriate packing blocks GF090 to fit under the gear block. This should normally involve a single 5mm packer on both left and right sides. Due to subtle variations in the hull/deck height of each Laser dinghy, we have allowed for smaller or larger gaps to be accommodated by using smaller packers or stacking multiple spacers to fit appropriately



Fig 10 Gear block with retaining pin inserted through the centrecase insert. GF007

Select the appropriate packer thickness and use the screws provided to attach the packer to the underside of the gearblock. Use shorter screws for up to 5mm packing height and the longer screws for larger packers. We have found that a small amount of Superglue on the face of the packer will help it bond to the gearblock and remain aligned.



Fig 11 Gear block with packers attached with screw



Packer



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It is not essential to have a perfect or particularly tight fit, but the closer the better. Once the boat has been fitted with the insert, glue and screw the blocks to the underside of the gear block using Superglue (not supplied) and allow it to dry before re assembling. There should be no further need to alter the packing for this specific boat. You only need to set this up once, after that, you can simply assemble by attaching the gear block with the Toggle pin.

Centreboard

Assemble the centreboard. This is simply achieved by inserting part GF002 into GF001. Push until the locking clip engages.



Fig 11 Assembly of Centreboard foil GF001 and lifting foil GF002

When returning to the beach, it is recommended to pull the foils apart for washing, transport and storage. To do this, depress the spring retaining clip with a key, or the end of the retaining hook as shown below.



Fig 12 Depress the spring clip and pull the foils apart.



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Insert centreboard

Launch the boat from your trolley in the normal way and take it into knee deep water. Tip your boat on its side in the water and insert the centreboard from the underside as shown in Figures Angle the board forward up the centrecase insert in the same way as with the standard Laser centreboard.



Slide the board fully into the centrecase pushing it all the way, until the stops on the wand prevent it going further. Then turn the boat upright taking care not to hit the wingtips on the bottom and preventing the board falling out.

Fit the Large Safety Clip

Firstly, attach the large centreboard retaining safety clip GF024 to your existing shock cord used to pull the board forward as shown in Fig.13 This clip has multiple purposes and MUST always be fitted through the 'keyhole', not the handle, on the starboard side prior to leaving the beach and immediately the centreboard is inserted. The Safety clip secures the board into the boat, prevents you chopping your fingers off when they are in the handle and positions the centreboard for engagement into the gear block at the correct height. The shockcord needs to be tight at all times, even with the board retracted. This can normally be achieved by attaching the shockcord from the bow. As a secondary safety feature we recommend attaching a second clip to the centreboard handle, or tie the end of the vang cord to the handle, to provide extra security should the safety clip be dislodged



Insert Hook in vertical position in keyhole



Fig 14 Safety clip in place.

Safety clip attached to the shock cord with a short cord, which is used to wrap around the retaining pin



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If you do not attach the safety clip through the keyhole you risk losing the centreboard completely out the bottom of the boat, destroying the internal face of the centrecase, chopping your fingers off or incorrectly engaging the gear block.



Fig 15 Pull board down and aft to engage in gearblock.
Pull the board down until the clip sits on the deck, then pull the board backwards to engage the gear block.

The Gear handle should always point down, prior to engaging the centreboard handle. Pull the handle backwards firmly, to engage the centreboard. Once engaged, the teeth in the handle mesh with the gears in the gear block, which rotates the gear handle into the horizontal position as shown.

It is very important now to rotate the large retaining clip 180 degrees and wrap the cord with one complete turn round the end of the toggle pin as shown. This pulls the board aft into the gear block and acts as a quick release should the foil hit an object in the water.

The foil is now fully engaged and ready to provide lift. To disengage the foil, simply undo the cord and push the handle forward.



Fig 15 Once engaged in the gear block, rotate the large retaining clip 180 degrees and wrap the cord around the pin with one complete turn as shown.



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Reducing lift in strong winds

In strong winds, you may wish to reduce the lift and fly low. To do this, rotate the gear handle part way, before engaging the foil. This will engage the gear one tooth away from the normal position, significantly reducing the lift of the main foil. You can also use this position for low drag upwind displacement sailing.



Fig 16&17 Rotate the gear handle part way, prior to engaging the handle.

Rudder

Each Laser rudder mounting is subtly different due to the location of the gudgeon fittings. We provide a set of Glide Free spacers GF008 specifically to suit our foiling kit and at the same time solve an age old problem of the tiller hitting the traveller cleat on the deck.



Fig 16 Rudder assembly including vertical rudder blade, horizontal foil and rudder box





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Rudder fittings

The Glide Free foiling rudders fit the existing gudgeon fittings on the hull of all standard Lasers, including both plastic and the older stainless fittings. The Laser rudder fittings themselves are strong enough to take the extra loads of foiling, however they must be attached with large screws and washers to prevent them pulling out, which can break the fitting and bend the rudder pintles.

The process to change the screws is extremely simple. Remove the existing screws and replace them with larger screws, with washers under the head, as shown below. Your boat remains race legal and is then able to withstand higher loading.



Thrust washer

Any of our washers may be used as a thrust washer, in combination with retaining clip No: GF014. This washer is attached by a cord to the retaining pin and MUST be installed prior to foiling. Otherwise the rudder will come off the boat when you foil.

The tie cord is attached to the thrust washer and retaining clip. Typical photo of the arrangement as follows.



Fig 17 Showing thrust washer in place



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Ideally your rudder box should be mounted as high as possible to provide clearance for the tiller above the traveller deck cleat. We have found that the gap in standard Lasers fittings can vary from by up to 10mm and so variable height of packing is required. Choose the appropriate packer thickness or combination of packers to give the best fit. This also removes any slack in the rudder fittings when foiling.

Alternatively, the packers can be added under the gudgeon, above the thrust washer, in order to remove slack in the rudder fittings when foiling. As they are removed each time the rudder box is attached, a hole is provided to retain these washers with a cord.

It is extremely important to tighten the bolt attaching the rudder blade to the rudder box. There should be no sideways movement of the rudder blade within the rudder box. A loose bolt can result in deformation of the rudder box when under high loading. The washers are purposely a tight push fit, so they will stay in place when you remove the rudder box from the boat. Ideally the tiller should be as high above the deck as possible so that it clears the traveller cleat.

Glide Free rudder washers are also a great asset for any standard Laser as they are purposely designed to raise the standard rudder box and prevent the tiller hitting the traveller cleat on the deck.

Trim adjustment

The Trim adjusting thumb nut is on the top of the rudder blade as shown. It is provided for on the water adjustment of the flying trim of the boat. Turn the nut anti-clockwise to trim the bow down for safe low level flight in heavy air and clockwise to trim nose up for easier takeoff in light air. It should only be necessary to change this trim to suit the crew weight and wind strength. Due to the unique design of the Glide Free Foil arrangement it is not necessary to alter this trim setting while sailing.

The adjustment of the rudder trim is set at the factory. Do not alter this setting until you have sailed the boat and determined if the flight attitude is correct.

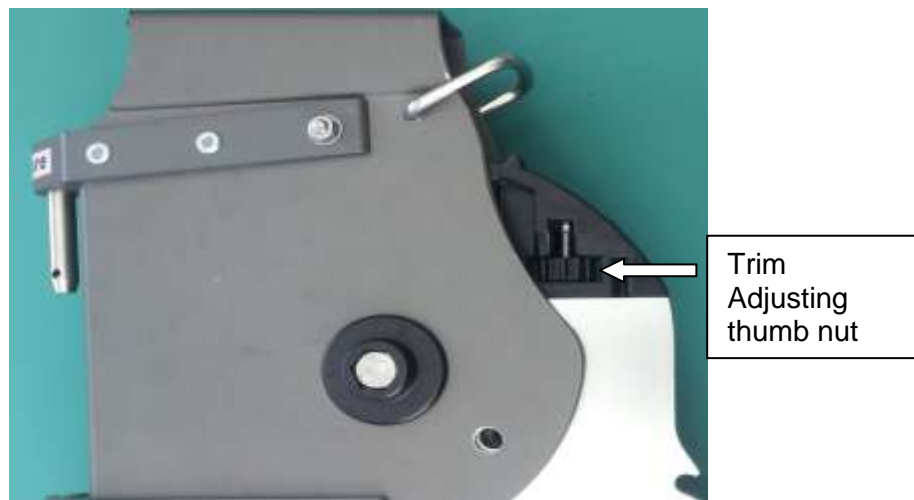


Fig 18 Showing trim adjusting thumb nut on the rudder



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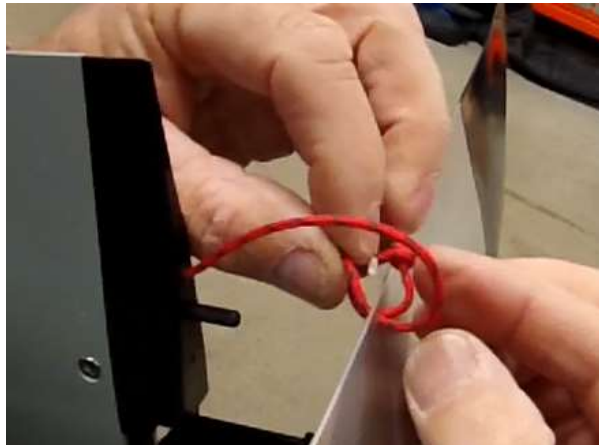
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Rudder retaining cord – This cord restricts movement of the horizontal rudder foil so that it does not fall vertically when the boat is not moving forward, which would act as a brake. It also releases automatically as the rudder is retracted, allowing the foil to remain horizontal to the water flow, enabling the boat to be steered easily in shallow water as it is launched and retrieved. This is a unique feature to Glide Free foils.



This cord does not have to be tight, it is only necessary to prevent the foil falling beyond approximately 15 degrees from horizontal.

To attach and detach the rudder horizontal foil, use the spring clip as previously shown for detaching the centreboard. You will also need to detach the cord at the rear edge.



To re-attach this cord, push a loop from the underside of the foil into the hole and bring the knot through the loop on the upper side, then pull tight.

Rudder retaining clip

This clip is attached to the standard Laser rudder box and provides two retracted positions. Position 1 is fully retracted and locks the blade clear of the ground when on the trailer or beach. Position 2 allows the foil to be semi submerged in shallow water.



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Fig 18 Rudder in the fully retracted position

This allows the boat to be easily steered while being sailed in shallow water when launching and retrieving. Once in deep water the clip is lifted, the rudder is fully deployed and retained by pulling the standard rudder cord and cleating it on the tiller, as used on all Lasers.

This system is well proven and overcomes some of the key issues with standard Laser rudders where the rudder does not stay retracted or is so tightly clamped it cannot be easily pulled into place with the pull cord. Care should be taken when returning to the beach or sailing in shallow water, as the rudder can be damaged or filled with mud and sand if not properly retracted. We recommend stopping the boat prior to coming in to the beach, retracting and locking the blade into position 2.

Always retract the rudder to Position 1 when on the beach or trolley to prevent damage by scraping on the ground. Fit the tiller in the normal way into the head of the rudder stock. A simple hint is to attach the tiller retaining pin cord to the rudder retaining clip.



Fig 19 Showing the rudder blade in the retracted position and fully deployed



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Fig 20 Reaching in a steady breeze

Operation

Once your centrecase insert is placed in the boat and gear block attached with the toggle pin, you are ready to attach the rudder in the normal way and go sailing.

a) Launch the boat and take it to knee deep water. Pull on the mainsheet and tip the boat on its side, sufficiently to allow you to insert the centerboard lifting foil into the centrecase insert from the underside of the hull. Allow the board to tilt forward, just as the standard centerboard does. Slide the oard fully within the centrecase until the wand prevents it going further. At this point you can tip the boat upright and the top of the foil should clear the boom, making the boat easy to handle even if the wind is strong.

b) Connect the safety clip immediately!. This is absolutely essential to prevent the foil falling out of the boat. Allow the board to be pulled forward, which holds/locks it at the appropriate height.



Fig 20 Launching in shallow water



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c) Lower the rudder to position two, hop on the boat and sail away. Do not sail fast or apply excess pressure to the foils at this stage, as the wand is not yet fully deployed, it will be heavily loaded if you sail at over 5kts. Once clear of the shore and in deep water (2m), firstly release the retaining clip on the rudder stock and lower the rudder, pull on the hold down cord and cleat in position in the normal way.

d) Lower the centerboard by pulling it backwards a little until it is free and lower it until the large retaining safety clip sits on the upper surface of the centrecase insert. Use the handle to pull the board aft, towards you, until it engages with the toggle pin and gear. Pull the top of the centerboard aft, until the gear handle moves upwards and is fully engaged. You are now ready to go foiling!!

e) It is now just a matter of practice and having some guts!! Start in a moderate 10-12kt steady breeze, bear away on to a reach and lean hard, as the boat lifts, bear away and pull in the mainsheet. Experience the thrill of lift off and foiling. Get the feel of the boat. Some of the things you will notice are the boat remains stable but all goes quiet save the swish of the foils and wand as the boat accelerates well beyond the wind speed. This feels like low level gliding and is a surreal experience.



Fig 21 For your first sail, choose a steady breeze and moderate 10-15kt winds.
Lighter sailors can use a Laser Radial rig, with very good performance.

You will also, perhaps for the first time experience relative wind sailing. As you speed up, you will quickly need to adjust the sails to prevent the boat simply falling back into the water as the sail luffs. You will need to respond by bearing away and sheeting in, always steering to keep the boat moving and prevent the sail luffing. In stronger breezes you will soon find yourself going very fast downwind with the sail sheeted in quite tight. Enjoy the rapid increase in speed and sheer thrill. This is what foiling is all about!!

Once you get the hang of reaching, gradually head the boat up into the wind, sheeting in and leaning hard. Allowing the boat to heel to slightly to windward is one key to successful upwind



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sailing and requires great skill to achieve. At all times you should use gentle, steady movements of the tiller, being over aggressive can make it more difficult to stay foiling.

Wing tip choice

In the beginning, it is recommended to use the large, high lift, Spitfire wingtip in 10-15kt winds, to get the boat to lift early and fly in moderate conditions and experience easy foiling. With some practice and skill, you will be able to graduate to the Delta speed foil wingtip for high speed in winds over 15 kts. This foil has a smaller area, less drag, significantly faster and is much easier to sail with in strong winds.

To change the wing tips, depress the locking pin with the nipple on the end of your Safety Hook and pull the tip out of the aluminium extrusion. You can then slide in the new tip, depressing the spring clip and then let it engage with the locking hole.



Fig 21 High lift Spitfire wing tip and low drag Delta Speed foil wing tip

Maintenance

Maintenance is a key part of looking after your investment and keeping your Glide Free Laser foils in the best possible working order.

It is most important to thoroughly wash all items with fresh water after each sail. While the foils are manufactured from corrosion resistant materials, they can be susceptible to attack from salt residues especially if left in the hot sun. It is also most important to remove any silt, sand or abrasive material, especially from the internal surfaces of the main foil and pushrod as this can wear and jam the pushrod. We have provided a flushing port for this purpose on one side at the top of the board. This will clear the internal cam and pushrod mechanism.





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Unclip the lifting foil and wash thoroughly with fresh water. Preferably allow the foils to dry before placing them in their bags. Do not leave the foils in sand or mud, avoid leaving them in direct hot sun. This is why protective bags are supplied.

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