

# *VIPER*

# *640*

## *OWNER'S MANUAL*



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## **INTRODUCTION**

Congratulations on the purchase of your new Viper and thank you for choosing our boat. We are confident that you will have many hours of great sailing and racing in this truly excellent design. The Viper is an exciting boat to sail and offers fantastic performance. It is a lightweight racing boat and should be treated with care. In order to get the most enjoyment from your boat and maintain it in top condition, please read this manual carefully.

Whilst your boat has been carefully prepared prior to shipment, it is important that new owners should check that shackles, knots and mast step bolts etc. are tight. This is especially important when the boat is new, as travelling can loosen seemingly tight fittings and knots. It is also important to regularly check such items prior to sailing. Make sure that you have a basic tool kit with you the first time you rig the boat in case there are tuning / settings changes that you wish to make.

### **FOR THE FIRST TIME YOU GO AFLOAT.....**

When launching and sailing your Viper for the first time, please remember the following points:

- New boats are covered in an invisible layer of mould release wax, and silicone release agents, in order to get them out of the moulds. They are also cleaned and polished as part of the pre-delivery inspection process. The first few times that you sail your new boat you should take extra care as it will be slippery and potentially dangerous until these coatings wear off.
- Ropes are also coated in release agents as part of their construction process, so again, take great care when tying knots or relying on lines to perform a specific function, as they may undo themselves and get you into a potentially dangerous situation.
- After sailing the boat for the first few times, take a wrench and screwdriver and check the tightness of all the major fittings (double check highly loaded fittings.)
- When lowering the keel for the first few times the packing may be a little tight, it tends to wear a little and is designed as a replaceable part. If necessary, spray a little McLube or similar lubricant onto the keel blade, as required, to make lowering and raising the keel easier.
- Last but not least, your boat has been designed to be easy to operate. If you find yourself needing to use excessive force, or tools such as hammers, then you are probably doing it wrong. It would be a good idea to stop and re-evaluate the situation. A quick phone call to the factory or your local rep could solve the problem much more easily...

Now, apologies to all the highly experienced, race winning and world champion yachtsmen amongst you for this last piece of advice! New boats always take some getting used to. If it is blowing the dog off his lead, and the waves are dumping on the beach, why not curb that impatience to get afloat in your new boat. If the conditions are favourable, the chances are that you'll have far more fun and learn the techniques used on the Viper much more quickly.

**For further information, spares and accessories, please contact your local dealer, or Rondar Raceboats Limited direct.**

**Your Viper has been supplied by:**



## **RIGGING INSTRUCTIONS**

1. Rigging the mast from new involves fitting the two halves together and ensuring that the halyards are not twisted. This is very important to ensure smooth running of the halyards
2. Fit the spreaders by bolting them through the appropriate holes in the brackets. The outer one goes through the aft hole in the bracket, and the inner end is positioned as far forwards as possible.



3. Once fitted correctly the excess bolt length should be cut off, and the ends filed smooth to prevent the spinnaker ripping on any jagged cut metal. It's always a good idea to wrap all of the potential snags the spinnaker may come in contact with using a little rigging or white electrical tape.
4. The standing rigging can then be fitted to the mast by inserting the upper ends (T Balls) into the Terminal sockets, and attaching the upper shrouds to the end of the spreaders using the clevis pins. Leave two holes showing on the spreader tip (pin through the third hole).



5. Take the dyneema keel hoist line and shackle it to the tang on the port side of the spreader bracket. Attach any wind indicators or similar to the head.



6. Measure the forestay BS to BS (Bearing Surface to Bearing Surface) and lock off the adjuster at 24ft 6". Undo the upper shrouds turnbuckles to maximum open.

### **Stepping the mast**

- 1). Ensure that the halyards are positioned so the free ends can be reached once the mast has been stepped.
- 2). Carry the mast to the rear of the boat, butt end into the cockpit. Best to keep the boat attached to the car to prevent the boat and trailer from tipping onto the stern when you are climbing aboard the rear of the boat. Usually one person can carry the rig alone but for the first few times, use two people until you get accustomed to moving the mast solely. You will place one person at the front of the boat to move the headstay onto the stem fitting and attach it with the clevis pin and split ring.
- 3). Using a small piece of line (or use a pair of Cunningham hooks measured to fit) tie the mast butt (lower end) to the forward most padeye, just forward of the keel. This allows you to pivot the mast on its butt without having it slide forward into the boat. Simply hand over hand stand up the mast inside boat, adjacent to the mast gate. One person should stand in the boat and lift the mast into place, taking care when lowering it through the gate in the deck and down into the mast step. Ensure the heel is properly located in the mast step. It helps to ensure that the mast step is clear of ropes before you start to lift the mast into position, and that the deck control rope is loosened off. *When stepped, visually check that the T terminals have not become jammed into the wrong positions when stepping.*
- 4). Attach the forestay to the aft hole in the stem fitting, as above described, securing it with clevis pin and split ring. This should be taped, as the spinnaker will contact this frequently. You can then let mast lean aft. The forestay will keep it from falling aft and the mast partners will stop it from falling side to side.
- 5). Attach the main shrouds to the large aft chain plates. Take up some slack on the turnbuckles.
- 6). Assuming the forestay is pre set to 24ft 6", then harden down the shrouds until you have about 4 to 5" of prebend in the mast measured between the back of the mast at the spreader bracket, and the straight line between the tip of the mast and the back of the mast at deck level. This will equate to around 32 on a LOOS gauge measured at the upper shroud. Check the mast is set symmetrically by taking the jib halyard down to each chain plate, and equalising the shroud tensions until the mast is symmetrical (even, side to side)
- 7). Connect the lower shrouds via the multi hole adjuster to the main shroud plates. They should be hand tight only at this point
- 8). Thread the mast gate control line around the front of the mast, through the block, back around the front of the mast, pull it tight enough to limit forward mast movement and jamb it in the cleat.

### **Rigging the jib**

- 9). Tie or shackle the tack of the jib to the aft hole of the bow fitting. *Tape the shackle to stop the spinnaker ripping on it when hoisting or lowering the sail.*

- 10). Tie the halyard on to the head of the sail. Thread the jib sheet through the clew blocks on the sail. Attach the luff of the sail to the forestay using the clip on hanks.
- 11). Thread the lower end of the jib halyard through the double block on the fine tune system under the foredeck, and then up through the port side deck block, and cleat.
- 12). Hoist the jib by pulling the halyard up through the deck cleat. You will need to ensure that the jib sheet is slack. Do not over tighten the jib halyard, you will need the travel on the fine tune system
- 13). Tension the luff using the 4:1 fine tune positioned under the foredeck.

### **How to tune the mast before sailing.**

Once the jib is hoisted and the rig tensioned, you should check the rig settings as rigging lengths can vary and the shroud settings indicated above only give a guideline. A good sailing tension is 150 – 180 kg (285 - 400 lbs) measured on the jib luff wire. This is a lot of tension and will require quite a strong pull on the tension system rope.

There should be at least 110mm (4.33") of pre bend, which is controlled in the main part of the mast by the upper shroud tension. **Note, the spreaders are positioned in a "safe" setting. Alterations are made at the owner's risk – moving the spreaders to extreme forward settings may result in rig failure by the mast inverting downwind with the spinnaker up.**

The mast should look like this when correctly tensioned.





The lower shrouds should allow the lower part of the mast to pre-bend. They should not carry much tension until the mainsail has been hoisted and the gnav attached. The lowers shrouds merely prevent excessive bend from the vang in the lower part of the mast. Reduce tension in the lowers if they stop the mast from assuming a natural curve from the pre-bend caused by the spreaders. **Note that too much tension in the lowers will encourage the mast to invert downwind, and this can lead to mast failure.**



#### Viper 640 rig setup / tuning

	Wind speed	Headstay	Upper Shrouds	Lower shrouds	Mast gate
Light	0 - 9 Knots	7571mm/239" bearing point to bearing point (-8mm for hull #'s < 69)	minus 2 turns	minus 2 turns	choke forward 20mm to 5 knots
Base	10 - 14 knots		30 on LOOS PT-1 (US or metric)	Snug only - no tension	No chocks
Medium - Heavy	15 - 19 knots		plus 2 turns	same as Base	med chocks - choke forward to maintain prebend
Heavy	20 + knots		plus 3 turns	minus 2 turns	med chocks - choke forward to maintain prebend

#### Viper 640 suggested trim settings

	Wind speed	Outhaul	GNAV-upwind	GNAV - downwind	Jib Halyard	Jib track	Jib Barber Haul	Jib sheet	Mainsheet upwind	Mainsheet downwind
Light	0 - 9 Knots	soft - med	none	none to light	soft	plus 1 fwd	25mm in	soft	soft	trim for best VMG
Base	10 - 14 Knots	med	light	light to med	soft - med	even break in telltales	10 - 20mm in	firm	med - firm	trim for best VMG
Medium - Heavy	15 - 19 Knots	med-full	med- full	med	med	even break minus 1	none	firm	firm - slight ease in puffs	Ease only to safety trim position
Heavy	20+ Knots	full	full	full - up to 10% ease	full	minus 2 - 3	none	ease in puffs	ease in puffs	Ease only to safety trim position

**NOTE:** The very first time you apply rig tension, you may hear some settlement noise from the rig and hull (odd creaks, cracks, groans, etc.!). This is quite natural and is because all of the separate components are “bedding in” and stretching or moving to their normal tensioned positions. After the first few sails, so long as you stay within the parameters described above, this will stop.

#### Rigging the asymmetric spinnaker (add a series of photos???)

- 14). Thread the spinnaker halyard in the following order:

From the mast, down through the block on the deck to starboard side of the mast step, and aft through the block at the rear of the keel case recess, and then through the aft block at the end of the sock, and up through the sock to the bow.

- 15). Attach the spinnaker as follows:  
Tie the line from the forward end of the bowsprit to the tack of the spinnaker.

To ensure that the sail is not twisted, run your hands up the red luff tape on the spinnaker until you reach the head of the sail, then tie the spinnaker halyard on to the head of the sail.

Tie the middle of the spinnaker sheets to the clew of the sail. Lead the ends through the blocks amidships on the gunwhales, and then forwards to the ratchet blocks near the shroud plates (ensure you thread it the correct way through the ratchets, which only work under load), and tie the ends together.

The spinnaker halyard tail (spinnaker downhaul) comes from the chute mouth, leads through a loop on the lower third of the spinnaker and ties onto the webbing stop on the top third of the sail. *It is a good idea to tie it on with a long loop, say 300 mm (12") here, as it makes the spinnaker enter the chute more easily when dropping.*

*The safest and easiest way to rig the downhaul is to pull the pole right out, and to pull the port sheet tight into the ratchet and to cleat it off. If you then hoist the spinnaker until the head is about 2 metres off the ground you can then see the two attachment points on the spinnaker. You can then thread the spinnaker downhaul under the foot of the sail and sheets, up through the lower ring, and tie it to the top loop.*

- 16). You can then pull the spinnaker into the chute by pulling on the downhaul at the block just aft of the spinnaker sock. *If the spinnaker will not stow away completely, then check that the halyards and the sheets are un-cleated.*

### **Rigging the mainsail**

- 17). Slip the clew strap around the aft end of the boom.
- 18). Thread the outhaul through the clew eye and hook the end into the slot on the end of the boom.
- 19). *Ensure the boat is head to wind.* Tie the main halyard to the head of the sail with a VERY short bowline or a dinghy hitch and hoist the mainsail. Pull the halyard tight through the cleat to ensure all slack is removed and the main is fully hoisted. Make CERTAIN you do not hoist the main halyard slipping through the cleats as this only wears them down limiting their holding power. Place the halyard next to the cleats to hoist then simply slide it into the cleats once the halyard is FULLY hoisted.
- 20). Fit the boom onto the gooseneck, and fit the two webbing tack straps around mast. Tension the outhaul to sailing position.
- 21). Thread the cunningham line through the cringle above the tack and tie the end around the gooseneck fitting.
- 22). Attach the gnav upper strut to the upper mounting post, and fit the gooseneck retaining pin to prevent boom pulling off.

### **Rudder**

- 23). The rudder blade simply slots into the transom gudgeon AFTER launching (prevents rudder damage) and has a retaining clip to prevent accidental dislodging. It is sensible to also tie the rudder on in case of accidental removal, during a capsize for example



## **Launching**

Individual launching areas vary and common sense will determine the best order of proceedings when launching the Viper. The boat launches from its trolley just like a dinghy, and can be launched from a crane hoist, slipway, shore or beach with ease. The boat will sail with just 0.5 metres (20") of keel down, and although it is less stable in this mode, it will not capsize.

**Option 1.** The favourite option is to launch the boat from a crane or slipway, with a convenient dock nearby. Put the boat in the water once the jib and spinnaker have been rigged. Tie it head to wind to a dock or mooring, lower the keel and then hoist the mainsail.

**Option 2.** If option 1 is not possible, rig the jib and spinnaker, launch the boat, walk it into deep enough water to lower the keel half down, sail the boat off under jib alone, then drop the keel and hoist the mainsail in deeper water.

### **IMPORTANT**

**When you are ready to launch, ensure that the keel hoist purchase is securely cleated. When craning in , double tie the loose end to avoid the keel suddenly dropping in mid air.**

**Always ensure the keel lift purchase blocks are not "eased" and that there is no slack or any "loops" caught in the purchase that may pull out and allow the keel to drop unexpectedly.**

**Keep your fingers and feet and all ropes and controls away from the keel slot and the top of the capping until the keel is fully lowered.**

**The boat will feel less than stable until the keel has been lowered at least half way down.**

**24).** Once the keel is almost fully lowered, you will need to guide it onto the mounts, using the hoist purchase to swing it into position. Then un-hook the keel hoist line and stow it in the side locker.

**25).** Fit the retaining bolts to the keel before leaving the dock.

**NOTE: The keel must ALWAYS be secured in place with the keel hold down bolts prior to sailing the boat fully.**

When bringing the boat ashore, reverse the above process. Lower the keel back onto the trolley cradle as soon as practical to reduce the loading on the rig.

## **TUNING AND SAILING TIPS**

### **Keel**

The keel should be left fully down while sailing. Only lift the keel for launch and recovery, or in the event of grounding.

### **Cunningham or Downhaul**

Increasing the tension progressively bends the mast, flattens the sail and opens the leech. In lighter airs keep it fairly slack and progressively increase the tension up the

wind range. Extreme tension should blade the upper leech out flat in very strong conditions.

### **GNAV Kicker** (Vang spelled backwards)

The more wind there is, the more gnav you need. It powers up the leech helping pointing upwind and maintaining power on the reaches. In very gusty conditions, easing it will make the rig more forgiving. Ease it down wind, prior to bearing away.

### **Jib sheeting**

To tighten the jib leech, move the jib track cars forwards and vice versa to loosen it.

### **Tacking**

For best speed out of the tack ease the sheet about 150mm (6") as you go through the tack and then tighten it again when the boat has accelerated on the new tack.

### **Spinnaker hoist**

The spinnaker halyard is led so that either the helm or the crew can hoist and drop the sail.

First, ensure the spinnaker sheets are not cleated. Bear the boat away on to a run (this is not necessary in very light winds). The forward crew should pull the pole out first, or simultaneously with the middleman hoisting the spinnaker. Do not sail for long with the pole out prior to hoisting. The sail could catch in the water and drag the whole sail out of the chute and under the boat.

### **Gybing**

Always gybe with the boat sailing as fast as possible. In breezy conditions the helmsman should steer back into the gybe as the boom comes across, so that the boat is travelling straight downwind as the sails fill on the new side.

### **Spinnaker drop**

Bear away onto a run (again, this is not necessary in light winds). The crew should release the pole outhaul and the spinnaker halyard. The middleman or the helmsman can then drop the sail retrieving it into the chute with the dousing line (other end of the spinnaker halyard). As the sail is pulled into the chute, the bowsprit will automatically be pulled back into the boat.

### **Downwind sailing**

The Viper has a lightweight and high performance rig. In breezy conditions it is essential to "look after" for your rig downwind by adhering to the following points:

- Make sure you have sufficient rig tension applied (remember rigging stretches).
- Make sure you have a sufficient mast rake
- Make sure the spreaders and lowers give at least 110mm(4.33") of pre bend to the mast.
- Make sure the deck level bend control is not over tight – let it right off, then pull on firmly again.
- Put a stopper knot in the mainsheet so that the boom cannot touch the shrouds. (We suggest you tie the knot to stop the boom, 6- 8" from the shrouds)
- Keep the cunningham on tight downwind, to help lock in the pre bend.
- Keep the boom sheeted in as far as possible (there is not normally much load on the mainsheet due to the apparent wind moving forward), so that the leech holds the top of the mast back. The leach of the main acts as your backstay on the Viper.

# CARE AND MAINTENANCE

## Hull

The Viper is made using a GRP foam sandwich laminate. This is stiff and light, but will dent if subjected to point loading. The boat should be supported ashore on a factory supplied Viper dolly or trailer.

### **Keep your boat drained and well ventilated**

Obviously in dealing with a marine environment, equipment gets wet, which in itself is not a problem. The problem starts when moisture is trapped for any length of time. The key, therefore, is to store the boat properly ashore. Water absorption could cause blistering and a raised fibre pattern.

- a) Ensure the boat is kept at an angle to allow water to drain away.
- b) If leaving a cover on the boat, ensure that the transom is open and down for drainage.

### **Wash with fresh water**

Fresh water evaporates far more quickly than salt water, so if your Viper has been sailed in salt water wash it off thoroughly. The fittings will also work better if regularly rinsed.

## Damage

Hull damage falls into three categories:

- a) **SERIOUS** e.g. A large hole, split, crack or worse. Get the boat back to your nearest dealer – don't be too distressed! Most problems can be repaired by an expert.
- b) **MEDIUM** e.g. Small hole or split, gel crazing. If this occurs during an event, sailing can often be continued as long as drying the area and applying a strong adhesive tape prevents any leaks. **CAUTION** – if the damage is close to a heavily loaded point then a close examination should be made to ensure joints and the laminate are fit for the prevailing conditions. Get the damage properly repaired as soon as possible.
- c) **SMALL** e.g. chips, scratching. This type of damage is not life threatening, particularly as the boat is built using epoxy resin, and therefore allows virtually no water absorption into the laminate. The owner, using the correct gel coat, can repair this type of damage.

## **Tying down**

Tying down your Viper to its trailer is important because too much or too little tension could result in damage. Only use an approved dolly or trailer. The boat is well located on its dolly, so you only need apply sufficient tension to hold the boat in contact with the supports.

Tie the boat down at the bow and across the middle in the region of the trailer wheels. Pad the deck where the straps touch. Use the strap winch at the bow to hold the bow tight. You will need to tie a small, double-looped line to attach the bow winch to.

## **Foils**

The foils are vinylester GRP with a foam core. Look after them as you do the hull. Wash with fresh water regularly. Repair any chips as soon as possible using polyester gel.

If you intend to travel a lot with the boat, then a padded rudder bag will be a worthwhile investment.

### ***Noisy Foils***

The Viper foils are vinylester GRP for easy repair and maintenance, and are made from precise moulds and tooling. However, vibration from the foils can occur from time to time, and is impossible to eliminate completely in the quality control process.

Foil vibration usually occurs due to the eddying effect of water leaving the trailing edge of the foil. To ease this effect, gently abrade the back edge of the foil (approx 25-35mm <1"> will suffice) from top to bottom with progressively finer grades of sandpaper to 'sharpen' the trailing edge of the foil. A power sander is the quickest method – it's not an issue if you penetrate the gelcoat, but ensure the trailing edge is fair along its length. You can also put a slight bevel on the trailing edge leaving no more than 3mm (.1") at the very thinnest part of the trailing edge. This often allows for a cleaner exit of water flow, thusly reducing or eliminating foil vibration.

## **Spars**

The mast, boom and bowsprit are carbon composite structures. Wash with fresh water as often as possible. Check the sheave at the mast head, along with both jib and spinnaker halyard sheaves for wear.

The mast is finished with a coat of two part polyurethane varnish. This protects the laminate against UV degradation in sunlight. It is advisable to apply a new coat of varnish once a year. Lightly sand the mast to help the new varnish bond to the old.

It is particularly important to avoid chafe to the spars when trailing, as with carbon spars it is very easy to cause structural damage on long cross continent trips. Pull all the halyards into the mast and use suitable padding to protect the spars whilst trailing

## **Sails**

The main and jib should be rolled and stored dry, out of direct sunlight. Dry the spinnaker, fold it and store in its bag.

When using a new sail for the first time, try to avoid extreme conditions because high loads on a new sailcloth can diminish the racing life of the sail.

If your sail is stained in any way, try to remove it using normal detergent and warm water. Do not attempt to launder the sail yourself.

Repairs should be temporarily made using sticky number cloth or sail repair tape and then returned to the sailmaker for a professional repair. Watch out for wear and tear, especially around batten pockets and the bolt rope.

Replacement sails can be ordered from your dealer, as can a full range of spares and accessories.

# VIPER CLASS ASSOCIATION

The Class Association is highly active and well established and well worth joining.

The Viper Racing Circuit is fast becoming the envy of the 20 foot sportboat world, with great competition and a fantastic and friendly social life. Please note that you do have to be an Association member in order to compete in class sanctioned events.

The Class Association also produces regular Newsletters, organizes training events and hosts a highly popular forum at <http://forumViper640.org>

The International Viper 640 Class Association will be centred around the Viper640.org website.

Please use this site as a point of reference for all your enquiries.

<http://www.Viper640.org>