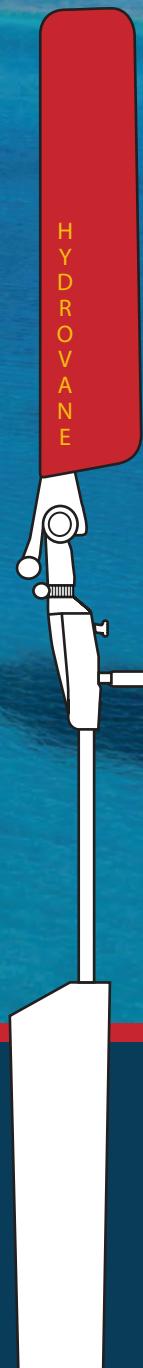


# OPERATION & TROUBLESHOOTING GUIDE



★ ★ ★  
**HYDROVANE**  
STEERING THE DREAM

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# OPERATION & TROUBLESHOOTING GUIDE

MARCH 2023

*We are always pleased to receive photos and performance reports! If you are having any type of problem, please read this guide carefully and do not hesitate to contact us so we can work through it with you.*

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## Appendix: Parts List and Schematic

### A. OPERATION OVERVIEW

#### Sailing – Hydrovane in Use

1. Remove Vane Locking Pin #60 and Shaft Locking Pin #61. The Hydrovane Rudder will be free trailing.
2. Hold Course - Sail onto the desired course
3. Trim the sails for good balance. You should feel minimal loads on the main wheel or tiller.
4. Put the Hydrovane Vane 'in irons', into the wind: Pull one or other of the Course Setting Lines to turn the Vane until its leading edge is approximately in line with the wind direction. The leading edge of the Vane is the side that comes straight down to the casting. The leading edge of the XT Vane has the coupling to tighten the Vane onto the composite Rod. The Balance Weight Pair should also point into the wind.

On the VXA1 model (no Remote Course Setting Assembly), slacken Course Clamp Knob #34, turn the Vane into the wind, and tighten the Knob in the position required.

5. Lock/secure the boat's wheel or tiller in that position that holds the boat tracking well – typically not on center line. It is important that the wheel or tiller is fixed rigidly so the main Rudder cannot move. See Section E for Ideas on how to effectively lock the wheel or tiller.
6. Engage the Hydrovane – Pull out Ratio Knob #21 and move it to the far left position "1" (to start, depending on conditions).
7. That's it! Enjoy!

#### Sailing – Hydrovane Not In Use

1. Vane Locking Pin #60 inserted to hold Top Lever stationary. It's a good idea to take the Vane off.
2. Move Ratio Knob #21 into neutral far right position, marked "N" on new units

3. Shaft Locking Pin #61 MUST BE REMOVED to leave Hydrovane rudder free trailing

**Warning:** Do not lock off the Hydrovane Rudder while sailing. It must be left to free trail behind the boat. Locking it off while sailing puts great pressure on the Rudder and Shaft.

#### Motoring – Hydrovane Not In Use

1. Vane Locking Pin #60 inserted to hold Top Lever stationary. It's a good idea to take the Vane off.
2. Move Ratio Knob #21 into neutral far right position, marked "N" on new units
3. Shaft Locking Pin #61 (below the Tiller) can be inserted to lock the Hydrovane Rudder central, although some boats have no problem keeping it free trailing under power as well.

LIMIT VIBRATION WHILE MOTORING. Some engines cause considerable vibration which may transfer to produce quite a chatter of the Hydrovane Rudder. Its length and weight combined with the loads created by the water and boat speed can result in hammering on the locking pin that holds the Shaft in place – in these cases, fracturing of the Shaft Locking Pin becomes inevitable (designed weak point). If you notice vibration, the solution is to break the harmonic chatter by cinching up the rudder with considerable force.

**Tip:** A heavy duty rubber snubber in the line is the answer – same as is used on dock lines. Take the line with the snubber from the Hydrovane Rudder onto a cleat – heave hard before tying off.



Snubber



Shaft Locking Pin #61

#### Motoring – Hydrovane In Use with Tiller Pilot

1. Hook up Tiller Pilot up to Hydrovane Tiller Extension that you've fabricated (or we have supplied)

2. Vane Locking Pin #60 inserted to hold Top Lever stationary. It's a good idea to take the Vane off.
3. Move Ratio Knob #21 into neutral far right position, marked "N" on new units
4. Shaft Locking Pin #61 removed to leave Hydrovane Rudder free trailing
5. Lock/secure the boat's wheel or tiller so main rudder is fixed
6. Engage Tiller Pilot to control Hydrovane Rudder



Beneteau First 405



Crealock 40

### Motoring – Entering or Exiting Port

Most choose to install the Hydrovane Rudder for passages and remove it before entering a marina. The Rudder is designed for quick release. It is held in place with the Rudder Locking Pin. You can pop that pin out by pulling it by hand or with a boat hook and the Rudder will drop off the Shaft. Haul it onboard. Caution, if not secured by a strong tether line, it will go straight to the bottom!

If not possible to remove, the Hydrovane Rudder can be locked in the fore and aft position for motoring and coming into a marina. Yes, you will probably lose some maneuverability. However, if you have an extra pair of hands who can operate the Hydrovane Tiller and Rudder you will find your ability to turn in tight spaces considerably enhanced as the Hydrovane Rudder is further aft – more leverage, cleaner water.

Full keeled boats or those with the main rudder further forward can benefit from this. Another idea is to have two bungee cords attached to an extension on the Hydrovane Tiller to keep the Hydrovane Rudder fore and aft. When needed, it is then easy to reach behind and turn the Tiller one way or another for added maneuverability (or to help overcome prop wash). As soon as you let go, the bungees pull the Tiller back to center.

Ideally you will take Rudder off as often as possible – when at anchor or in port. Taking the Rudder off means less wear on the Shaft Bearings and Rudder hole, and less growth on it.

That being said, if it's more of a pain to remove on your boat, antifouling it is a good idea. Scuff the Rudder up using some sandpaper and paint with a non-ablative, hard paint.

## B. VARIABLE CONTROLS – RATIO AND VANE AXIS

On some yachts a single setting of both Vane axis angle and Ratio Knob position may prove satisfactory under most conditions. On others, specific combinations of ratio and axis angle will greatly improve performance for different wind strengths and points of sail.

The end result should be an easy waving motion of the Vane as it swings from side to side – rarely banging at the stop and not spending long periods without moving.

You will soon learn what positioning works for you and develop your own technique. Surprisingly, many users are happy to leave the settings alone, seeing no need. Depends on your desire to tune!



Pull out Ratio Knob to choose setting



Ratio Knob Positions "1", "2", "3", "N"

## Ratio Control (Steerage)

There are three settings for different amounts of power and Rudder angle.

On units 2022 and newer, the gear settings are marked by number on the Bottom Lever casting.

Ratio Knob Position	Rudder Deflection	Power Amplification	Explanation
Far Left – “1”	15 degrees	3 : 1	Most power, least steerage, best for light airs
Middle – “2”	25 degrees	2 : 1	Normal to boisterous conditions
Right – “3”	35 degrees	1 : 1	Least power, most steerage, for heavy weather
Far Right – “N”	Up to 50 degrees	Neutral	Vane disengaged. Emergency steering.

## Adjustable Vane Axis

The inclination of the Vane can be set from 0 to 30 degrees for varied responsiveness:

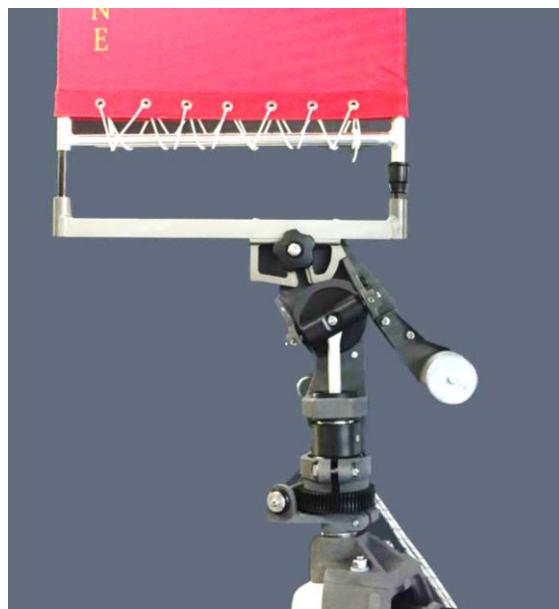
Watch the wake and try to reduce the ‘snake pattern’. As wind strength increases, if the vessel is being over steered with each correction being too dramatic, then adjust the axis:

1. Slacken the Axis Knob #33, using the Balance Weight as a handle
2. Incline the axis to any degree up to 30 degrees
3. Tighten the Axis Knob #33 to hold inclination
4. Observe performance:
  - If the yacht is moved repeatedly through the correct heading, the Hydrovane is still too responsive, and the Vane axis should be inclined farther.
  - If the yacht returns too slowly to the correct heading, increase responsiveness by moving the Vane axis and Vane closer to vertical.
5. If necessary, combine these adjustments with alterations in the position of the Ratio Knob to obtain optimum performance. Remember, boat balance and sail trim are key!

Axis Position	Responsiveness / Sensitivity	Conditions
Vertical	Most	Light to Normal Conditions
1 to 20 degrees	Mid	Normal to Heavy Conditions
20 to 30 degrees	Least	Heavy Conditions



Slacken Axis Knob to incline the Vane



XT Vane Base allows Vane to stand tall

One of the benefits of the XT Vane relates to this adjustable axis. In heavy weather, you have the ability to change the axis (decrease responsiveness), while keep the Vane standing tall for maximum exposure to wind. This is helpful downwind. In the photo you can see that the axis has been adjusted to 30 degrees, but the XT Vane itself is not declined; it is still standing tall. This is also possible with the Standard and Stubby Vanes, although their Vane Base Casting is not really designed for such.

### Suggested Settings

A review of the above. Please note these are approximate guides as every boat is different. You will determine what settings are best for you as you sail with the Hydrovane in a variety of conditions.

#### LIGHT WIND

- Ratio Knob in far left position "1": Maximum power amplification. Least Rudder deflection/steerage.
- Standard or Stubby Vane standing tall
- For XT Vane – extend fully
- Very light air, hook up a Tiller Pilot to the Hydrovane Tiller

#### MODERATE WIND

- Ratio Knob in far left or middle, position "1" or "2". In sloppy seas, middle position "2" is better
- Consider partially declining axis (reducing responsiveness) to straighten snake wake, if required
- With XT Vane you can move to middle position "2" earlier, leaving the Vane extended unless in squally conditions

#### HEAVY WIND

- Ratio Knob in middle or right, "2" or "3". Need for power amplification is reduced as strong winds provide plenty of power to move the Vane. Most Rudder deflection and steerage for conditions.
- Partially decline axis (to further reduce responsiveness) to straighten snake wake, if required
- For XT Vane – reef completely or almost completely to ensure you don't damage the Vane

#### STORM TACTICS

- Ratio Knob in right position "3" for least power to reduce over steering, but maximum Rudder deflection
- Fully decline axis (reduce responsiveness as much as possible) to calm down Hydrovane action even further
- For XT Vane – reef completely

**Tip:** It is possible to engage your Autopilot to work in tandem with the Hydrovane! If surfing conditions are encountered, this can work very well and provides much peace of mind; the autopilot will compensate to keep the boat on course when the boat goes through dramatic speed changes while surfing down a wave. This duo function is also incredibly useful during sail changes and has been used effectively in storms.

**Warning:** If you are not using the Hydrovane as part of your storm tactics, do NOT lock off the Hydrovane Rudder. It must be left to free trail behind the boat. Locking it off while sailing puts great pressure on the Rudder and Shaft.

## C . YOUR FIRST TEST SAIL

Follow operation instructions.

We suggest:

1. Choose a day with a comfortable breeze. Avoid waters with strong current.
2. Start with the easiest point of sail: upwind.
3. Depending on conditions, first try the Vane vertical and try the Ratio Knob at the left setting "1".
4. Let us know how it goes...!

## D. TROUBLESHOOTING

*"After your initial expense of purchase and installation, there will be no piece of equipment on your vessel more prized than your mechanical self-steering. I don't know of a single long distance sailor who has given a name to the roller-furling system, nor of one who has not named the windvane ... trust me, out there on the Big Blue you will have many long and meaningful conversations with it.*

*But like all relationships, this one requires practice and patience. First and foremost, do not ask the windvane to make up for sloppy sailing. Balance your boat, starting with waterline trim. Keep the weight out of the ends and assure that the sails are appropriately sized, set and trimmed to the conditions. Excessive heel is not only slow, but places the boat on lines that the designer never intended, resulting in poor tracking ... Experiment with different settings ... to understand and optimize performance in various conditions."*

- Quoted from 'A Vane to Steer Her By' by Alvah Simon, Cruising World

Some customers find 'it just works', others find that there is a learning curve. If these instructions do not diagnose an operational or performance issue, please do not hesitate to contact us.

### Installation Issues

Review our Installation Guide. An improper installation will hinder performance.

- Repeat Final Inspection Tests, found in Section F of the Installation Guide.
  - The tests are worth repeating before you head off on any passage... just in case the Drive Unit or Tiller have been knocked or shifted out of line.
- If required, re-position the Tiller Assembly, Drive Unit or Shaft Assembly.
- If the Shaft has not been installed vertically, you will need to re-position Brackets.

- If the case of movement of the transom, Brackets, or Mounting Bolts, refer to Section A of the Installation Guide and address immediately.

## Operational Issues and Tips

- IMPROPER SAIL TRIM – This is the most common problem. First hand steer to see if the boat is tracking well. If it is not, a change must be made: adjust sheeting or change/reef sails. The Hydrovane is the teacher and is happiest when you have done a good job of sail trim and balance.
  - The sails must be trimmed so that the boat wants to go in the same direction as the desired course. If the boat wants to go elsewhere that makes it hard for autopilot, human helmsman and Hydrovane.
  - Sheeted too hard? "When in doubt, Let it out!" Ease the sheet on the main (a common error is to sheet the mainsail too hard) ... then do the same on the jib. Does any of that help? With autopilots many sailors have sloppy sailing methods oblivious to the strain that the autopilot must deal with. In fact many cruisers are a bit corrupted by autopilots - simply hoist the sails, cleat the sheets and leave it at that.
  - Over-canvassed? The quantity of sail is important for balance. Experiment with different amounts of reefing, and always reef early.
  - A big lesson can be learned from the long-distance single-handed racers. They focus all their efforts on the trim of the sails to the extent that their wheels are so light to the touch that their self steering has relatively little loads to deal with. A good test is to see if you can alter the course of the boat by only adjusting the sails. Once you have achieved that you know you have figured out how to trim your sails.
  - Unbalanced configuration? Is your headsail to big? Is it a genoa – a big jib with a long low-cut foot with a clew near deck level? Those genoas are an upwind sail designed for racing; they are not at all versatile for the needs of a cruiser. Slacking sheets on a genoa creates a loose bag at the top while the foot is still fairly flat. It is very inefficient and is not designed for reaching or downwind. We recommend taking the genoa to a sailmaker and have them create a new clew that effectively makes the sail nearly an isosceles triangle (leach and foot are nearly of equal length). As its sheet is slackened off the sail evenly changes its shape. Coincidentally a '140' genoa becomes about a '110' yankee type jib – an ideal sail for cruisers. Another big bonus of this re-cut of the sail is that you will have great visibility under it.

- Are you using a pole? Use of a pole to secure the headsail is a must. If the headsail is collapsing and filling or dishing back and forth, the balance of the boat is in constant flux. The boat is out of balance – unworkable for self steering and challenging for a helmsman. A pole is a must for both a spinnaker and to secure the clew of a jib when 'wing on wing' or even when the jib is to leeward if the headsail is collapsing in the trough of waves.
- How old are your sails? A baggy main means the luff of the sail could be luffing while the roach is sheeted too hard and driving the boat hard to windward.
- MAIN RUDDER NOT LOCKED IN THE RIGHT POSITION. The positioning of the main rudder's locked spot is critical to the Hydrovane's performance. Hand steer to find that on course "sweet spot" before locking it – typically never locked exactly on the centre line.
- ARE YOU SETTING THE VANE INTO THE WIND? Instead of relying on the windex at the top of the mast, look at tell tails closer to the Vane level to discover the wind direction.
- SEVERE WEATHER HELM? For boats with severe weather helm as the wind gains in strength so does the weather helm. Re-positioning of the Hydrovane Rudder is a temporary fix. Take a good sailmaker for a sea trial, and ask them. In changing or gusty conditions, the dynamics that the Hydrovane is relying on could need constant adjusting. This is especially so for boats with bad weather helm or a headsail that folds in rolly seas. As the wind gains strength, a number of things happen:
  - Boat speed changes which in turn changes apparent wind direction
  - Heel of the boat might change – lesser effect but contributes to the changing dynamics
  - The result is that the 'balance' of the boat has altered and the Hydrovane is fighting a boat that wants to go 'off course'. Time to adjust.
- MAJOR WINDAGE OR LACK OF AIR – We are generally not worried about dirty air – the big Vane will find the wind. However, if you do notice that the Vane is not going over when the boat goes off course, then this is something to consider. Very large aft enclosures could potentially create a buffer forcing the wind higher to get over it all leaving the Vane in a back eddy. This can occur on certain reaching conditions with less apparent wind and good boat speed.
  - Is the Vane getting clear air?
  - Is the apparent wind above 5 knots?

If your unit is pre summer 2009 you could upgrade your Rudder. The new version has both improved balance and more power. You are also an ideal candidate for the XT Vane.

## Wear Points

The following spare parts are the common wear points and replacements are included in the Offshore Spares Kit.

- Vane Cover (#76) – The lightweight ripstock nylon Vane Cover can last a surprisingly long time, but the sun takes her toll. Be sure to take the Vane off when not in use, and store out of the sun.
- Locking Pins – There are 3 Locking Pins (#60, 61, 62) on the unit, all the interchangeable. As discussed above, the Shaft Locking Pin should be changed periodically as it can suffer from metal fatigue while motoring. It's a good idea to rotate the pins from time to time and follow operational instructions to reduce vibration.
- Drive Sleeve (#19) – will develop grooves and may need replacement after 15,000nm or so.
- Shaft Bottom Bearing (#25) – will show signs of wear after 15,000nm or so.
- Axle (#47), Axle Screws (#40), Loctite 243

Older units and those that have covered many miles may need a bit more TLC and refurbishment. Refer to the Parts page on our website.

## Other Potential Issues

### LOOSE AXLES

*Problem: Decrease in ability to hold course. Vane and Rudder not effectively ‘talking to each other’. Movement and play noted in Drive Unit*

Axles are not usually in need of adjustment, especially on a new unit, but we have heard of it. This can also happen after ‘sloppy’ passages. One spare Axle, two spare Axle Screws, and Loctite 243 are included with the Offshore Spares Kit.

The two levers that rock back and forth, the Vane Lever (part #65) and the Bottom Lever (part #69), should be firmly in place – unable to slide laterally.

There are a total of eight small stainless steel Axles that allow all the movement in the mechanism. The Bottom Lever casting has a total of four Axles: on each side and also fore and aft. The Bottom Lever should comfortably rock up and down on its Axles but should have no lateral movement sideways or fore and aft – should be firmly held by those Axles. It is self-evident if any of those four Axles are loose as the end that sticks out should look the same for each.

For the upper Vane Lever casting, the Axles are more evident – two side by side on each side. Please note that the two Axles holding the black plastic Bobbin stick out more than the others and do not look even. The test is that the Bobbin cannot slide laterally – can only rock up and down.

Tests to see if there are loose Axles:

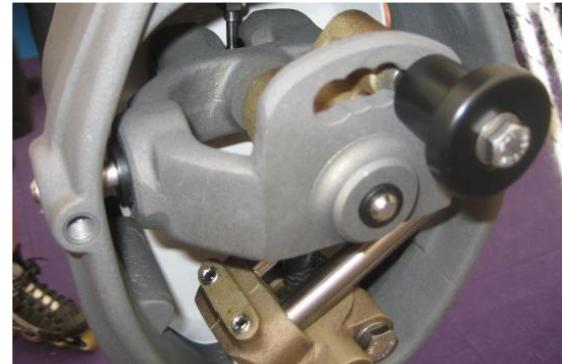
1. VISUAL - Can you see any of the Axles sticking out more than what you see in these pictures?  
Note there is only an upper pair that protrude more than the others.
2. PUSH THE CASTINGS – The castings that rock up and down - See if any slide laterally on their Axles. Push the two castings that rock (upper and lower) - push them laterally – on either the fore and aft direction or the side to side direction depending on which Axles you are testing.

If an Axle is loose, it needs to be reset:

1. Remove the Axle Screw – Use a hex wrench (allen key) to loosen the screw. Must have the proper fit as the screw is set in Loctite and you need to crack it loose.
  - Pre 2016 units have 3/8" Axle Screws
  - Post 2016 units have 10mm Axle Screws
2. Push the Axle all the way in – push it hard enough so that the lever is firm on its Axles on both sides. Tap it lightly with a rubber mallet (or the rubber handle of a hammer or tool) to be sure it is firmly in place.
3. Loctite – Lather the threads of the screw and hole with Loctite 243
4. Tighten the Axel Screw onto the Axle using Loctite to make sure it does not work loose



Axles on Bobbin and Top Lever



Axles on Bottom Lever

## JAMMED WORM GEAR

*Problem: Worm Gear feels very tight to move, or perhaps will not rotate at all when you pull the Remote Course Setting Line.*

Worm Bearings can swell in some environments.

The fix is simple: ream out the two Bearings with an electric drill.

1. Remove Worm End plate #92 – using a 5/32 SAE or 4 mm hex wrench
2. Use the same hex wrench to remove Grooved Wheel #82
3. Knock out the Worm Bearing on the opposite side as the Grooved Wheel by tapping lightly with a hammer - best is to use a block of wood against the Worm Bearing, then tap/hammer the wood. The Bearing is a compression fit – nothing but friction holding it in.
4. Wind the Worm out. Might require some muscling of the Wheel and Casting.
5. Once the Worm is out, both Worm Bearing holes can be reamed with an electric drill, reamer or file or sandpaper. The plastic is tough. You can see how much filings are removed and test the looseness of the hole with the shank of the Worm. Enlarge them by a ‘hair’ or so – enough to allow free movement and perhaps an extra ‘hair’ allowance for further swelling.
6. When replacing the Worm there is no particular position for it to engage with the Worm Wheel.



## JAMMED TOP BEARING

*Problem: The entire Top Mounting no longer rotates.*

The space between the #14 Top Bearing and #64 Heading Tube has become clogged with a buildup of salt and dust. Hopefully you only need to clean with hot or boiling water – poured on that gap while turning it. If that doesn’t work to loosen it up, contact us for further instructions.

## LOW PITCHED NOISE

*Problem: You become conscious of a low-pitched noise while underway using the Hydrovane*

This is a recent issue that only came to our attention in 2018. The solution is to modify the Hydrovane Rudder's trailing edge.

Some larger yachts, while sailing at faster boat speeds, may start to hear a low pitched noise from the Hydrovane. Sarah and Will sailed close to 10,000 nm with a Hydrovane on their Beneteau First 405 and never heard it. However, they did hear it sometimes while underway on their Jeanneau 43 in fast sailing conditions.

We recently discovered that a simple alteration of the Rudder's trailing edge will alleviate this low pitch humming should your boat be affected by it.

Please see the drawing below from "Principles of YACHT DESIGN (third edition)" by Lars Larsson & Rolf E. Eliasson, 2007, ISBN-10 0-7136-7855-0, p. 137"

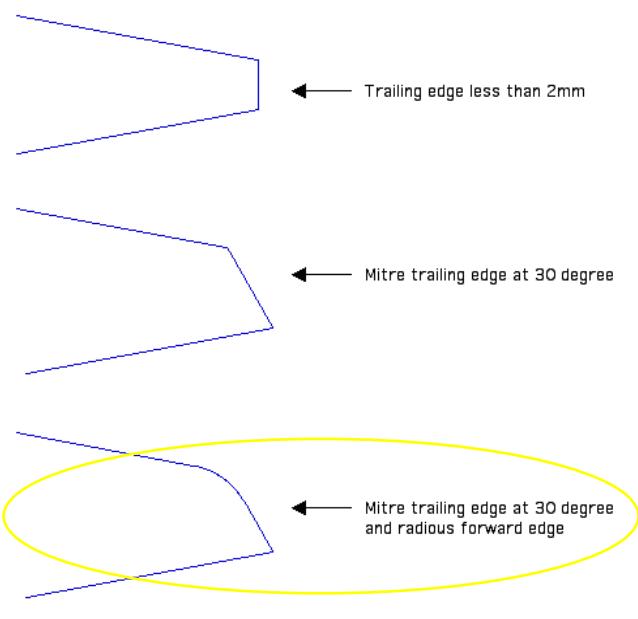
The choice for the bevel to one side is simply because it is the easiest to do.

The nylon is tough stuff to work with. Our method is to use a grinder then smooth with a sander, re-shaping the trailing edge of the Rudder to the shape shown as #8 below, with a relative vibration amplitude of zero.

Boat that had this issue have alleviated it with the bevel to one side.

**Fig 6.35** Influence of trailing edge geometry on vibration level

Case	Geometry	Relative vibration amplitude
1	Rectangular	1
2	Mitre trailing edge at 30 degree	1.9
3	Mitre trailing edge at 30 degree and radiused forward edge	3.8
4	Mitre trailing edge at 30 degree	0.43
5	Mitre trailing edge at 30 degree and radiused forward edge	0
6	Mitre trailing edge at 30 degree	0.38
7	Mitre trailing edge at 30 degree and radiused forward edge	0.03
8	Mitre trailing edge at 30 degree and radiused forward edge	0



### HYDROVANE RUDDER IS WARPED (not an issue)

Some customers come to us with concern that their Rudder is not straight. Rest assured, many Rudders have a warp, and we know there is no affect on performance.

A warp from vertical does not affect performance. Water flowing along the foil is not distorted, and it still has the same 'lift' and turning power. If the Rudder was twisted - that is a different matter.

None of our Rudders are truly straight. We know that even severely warped Rudders (from early manufacturing process) never had any negative effect on performance.

A Rudder left lying on deck in the sun is also likely to warp due to the heating on one side only. But once back in the water it should return close to its original shape as plastic has some memory.

## E. IDEAS

Some of these ideas have been sent to us by Hydrovane owners! If you have a cool idea to share with others, please let us know.

### IDEA! Stowing the Vane

- Make a pocket in the lifelines using sail cover material – eg – Sunbrella or equivalent
- On the back of a cabin door – install a bolt with dimensions that utilizes the same locking arrangement as is on the Vane – use a wing-nut or Vane Knob.

### IDEA! Retrofit a solar panel in place of Vane when not in use

A customer at Southampton has provided a nice idea. He has devised a bracket for the Top Lever on which a solar panel is fitted. The panel sits at the full deflection point which is 50 degrees off the horizontal – a perfect compromise angle.

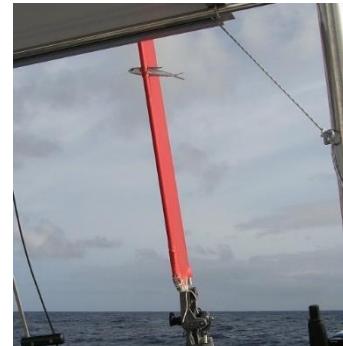
### IDEA! Fly your flag

Another customer came up with this and we took it to heart. We now offer a Flagstaff Holder that fits onto the Vane holder. See the PARTS page if you would like one.



### IDEA! Fix for ripped Vane Covers

Sail repair tape or duct tape is the standard method of keeping a Vane Cover together. When there is little to work with 'Saran Wrap' or clear plastic wrap for covering food can be wound around the frame. We recommend carrying a spare Vane Cover, especially if sailing in the tropics where the material will deteriorate in the sun.



### IDEA! Tell-tale on the vane: cassette tapes

It is handy to have a tell-tale on the windvane – top trailing edge. We have often heard that cassette tapes make ideal tell-tales. That is probably the only use for those cassettes... if you can find one.

### IDEA! LED stern light on Frame Case Cover

The plastic Frame Case Cover is very strong – easy to drill holes to fit a stern light – some ingenuity needed for the wiring and angling of the light, but the height is ideal.

In 2010 we changed the shape of the Frame Case Cover for this purpose and offer an upgrade with LED Stern Light – rated at 3NM – burns only 1.5W or 0.1amps.



#### **IDEA! Hydrovane Vane as riding sail**

At anchor, set the Hydrovane Vane amidships trailing aft and lock it in place – Ratio in neutral/far right and Vane Locking Pin inserted. Helpful when windy to minimize the ‘snaking’ of the boat at anchor. Best to make a cover for the Vane if you leave it on for this purpose often.

#### **IDEA! For mizzens – rotate Vane to horizontal, rather than taking it off**

We recommend the XT Vane for boats with mizzens – you are able to easily rotate it to horizontal when tacking or gybing.

#### **IDEA! Locking the main Rudder**

If only using a basic wheel lock, sometimes big quartering seas will push the main Rudder off the locked position. Some ideas, in addition to your wheel lock:

- Use quick release jam cleats on either side of the wheel – should only need to jam the windward side
- Devise a mini vice
- Custom adjustable tiller brake





#### IDEA! Adding a red marker to the Remote Course Setting Line

Provided by Dee & Pippa (Elizabethan 31): "*I sometimes found altering course with my Hydrovane's control lines difficult. It was worse at night. Sometimes I just couldn't think which of the two lines to pull. I would resort to trial and error. It worked, but I wasn't happy with it. Then the solution dawned on me. Mark the line!*"

*So I tied a Turks Head knot onto one control line. I used red line, so I pull the line attached to the Turks Head to turn the boat to port. Even I didn't need a marker to say the other one turns the boat to starboard. It has made life so much easier for both Pippa and I, that I thought to share it with you and other Hydrovane owners."*



#### IDEA! Reflective tape on the Worm Gear and Tiller for 'night vision' FOR 'NIGHT VISION'

Provided by Gordon (Moody 38): *Gordon puts 2 bits of reflective tape on the flat parts of the chrome end of the Worm Gear. At night, he can see how much he adjusts the Course Setting – each reflection (half turn) equals 3 degrees change in course. He also puts reflective tape on the Tiller so he can see if the boat is 'on course' or not.*

## F. MAINTENANCE

### Bolt Tightness & Unit Alignment

- RE-CHECK BOLTS – Periodically check that all Bracket and hull bolts are tight.
- Perform FINAL INSPECTIONS TESTS before long passages – see our INSTALLATION GUIDE or videos.

### Tethers on Everything!

- TETHER THE RUDDER – Use a length of line, not less than 3/8" (10 mm) diameter, tied through the Rudder handle and secured loosely to some point on the stern, to ensure that the Rudder is not accidentally lost.

**Warning:** The nylon Rudder does not float! A few are living at the bottom of the ocean...

- TETHER THE LOCKING PINS – All 3 Locking Pins have tethers on them
- TETHER THE VANE – the Vane Knob secures the Vane in place, but a tether is prudent.

**Warning:** The Vane is lightweight and may try to fly away when being taken on or off

### Reduce Vibration

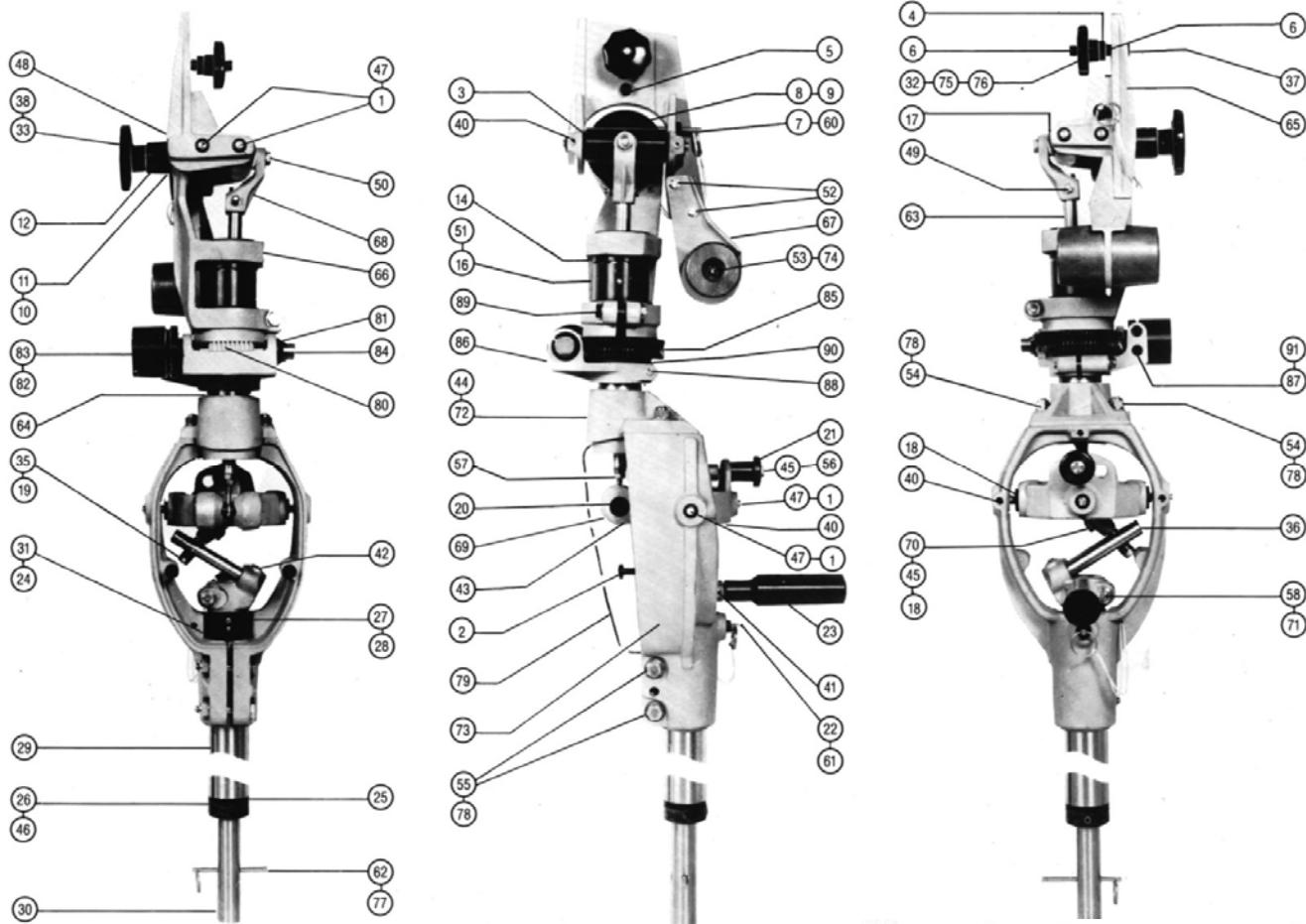
- ROTATE LOCKING PINS – The Locking Pins are interchangeable. The pins – especially Shaft Locking Pin #61 – will suffer from metal fatigue over time. Best to periodically change it with spares or rotate it with the other Locking Pins.
- REDUCE RUDDER HOLE WEAR – Take the Rudder off when not in use, especially for weeks or months at a time.

## Maintenance and Cleaning

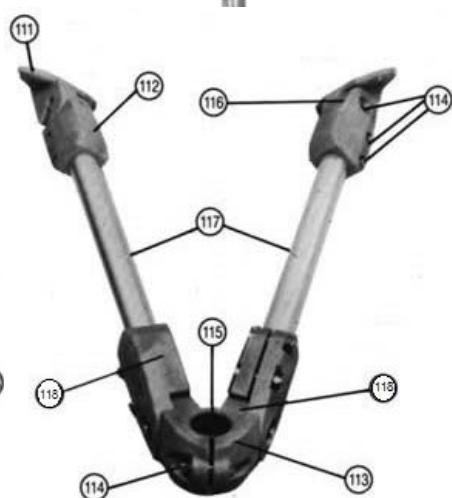
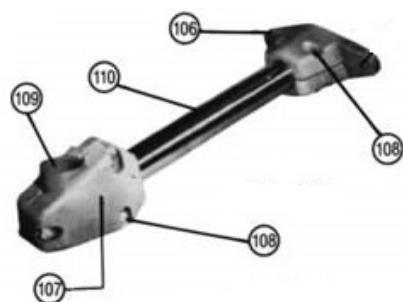
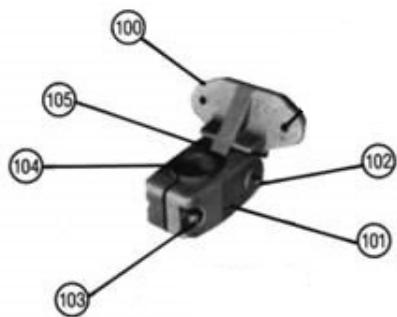
- SOAP AND WATER – When washing the boat, also wash down the Hydrovane with fresh water.
- WD40 – Every few months the entire unit, including castings, should be cleaned well with fresh water and soap. When dry, the unit, again including castings, should be thoroughly sprayed with a light aerosol oil such as WD40.
- SPRAY CASTINGS WITH CORROSION INHIBITOR – The gray metal aluminum casting could use periodic spraying with a corrosion inhibitor, especially the Brackets as they are closer to the water.
  - CorrosionX
  - T-9
  - LPS3
- DO NOT GREASE ANYTHING!
- EVERY JOINT SHOULD RATTLE – If any of the Axles or Bearings are removed for cleaning or adjustment (although no reason to do such), the unit should be reassembled so that there is a slight but noticeable end play between the moving parts. The Hydrovane is designed to ‘rattle’ – so, do not re-set those joints to remove the ‘rattle’ or ‘looseness’. The purpose of the loose joint is twofold:
  - There must be room for a delay in the transition from a course change in one direction to a course change in the opposite direction. Otherwise, the system would be ‘on’ all the time – another type of ‘over steering’.
  - The joints need space to accommodate salt and dirt build-up. Otherwise, a tight system soon becomes too tight causing unnecessary friction.

## HYDROVANE VXA2 SCHEMATIC

Drive Unit Model since 1986



## BRACKETS



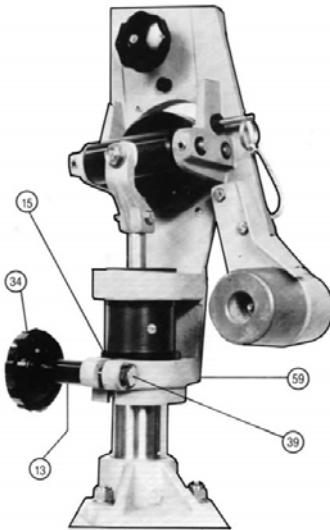
H Bracket Assembly

E Bracket Assembly

A Bracket Assembly

# HYDROVANE VXA1

Manual Course Control / Old Bobbin / Con Rod



## HYDROVANE VXA PARTS LIST

VXA 2 – remote course setting / VXA 1 – manual course setting

Part No.	Description	Material / Qty
1	Axle Sleeve	p8
2	Case Screw	p2
3	Bobbin	p1
4	Vane Slot Collar	p1
5	Vane Slot Peg	p1
6	Vane Slot Sleeve (OP)	p2
7	Vane Pin Sleeve	p1
8	Vane Axis Disc	p1
9	Vane Axis Washer	p1
10	Tilt Bolt Sleeve	p1
11	Tilt Bolt Washer	p1
12	Tilt Bolt Cover	p1
13	Heading Clamp Spacer	p1
14	Top Bearing	p1
15	Bottom Bearing	p1
16	Heading Collar	p1
17A	Bobbin Washer	s1
17B	Bobbin Cotter Pin	s1
18	Lever Bearing	p4
19	Drive Sleeve	p1
20	Ball Socket	p2
21	Ratio Knob	p1

Part No.	Description	Material / Qty
55	Shaft Bolt Set	s2
56	Ratio Bolt/Spring Set	s1
57	Ball Screw Set	s1
58	Fork Bolt Set	s1
59	Bottom Bearing Screw	s1
60	Vane Lock Pin	s1
61	Shaft Lock Pin	s1
62	Rudder Pin	s1
63	Con-rod	a1
64	Heading Tube	s1
65	Vane Lever	c1
66	Top Mounting	c1
67	Weight Arm	c1
68	Con-rod Top (old - OP)	c1
69	Bottom Lever	c1
70	Ratio Arm	c1
71	Fork Arm	c1
72	Top Frame	c1
73	Main Frame	c1
74	Balance Weight Pair	c1
75	Wind Vane Frame	a/c1
76	Wind Vane Cover	1

22	Shaft Lock Sleeve	p1
23	Tiller	p/s1
24	Shaft Top Bearing	p1
24M	Shaft Mid Bearing	p1
25	Shaft Bottom Bearing	p1
26	Shaft Bottom Collar	p1
26	Shaft Bottom Collar (new)	s1
27	Shaft Race Collar	p1
28	Race Collar Pin	s1
29S	Rudder Tube S 757mm	s
29M	Rudder Tube M 986mm	s
29L	Rudder Tube L 1240mm	s
29X	Rudder Tube X 1494mm	s
30S	Rudder Shaft S 979mm	s
30M	Rudder Shaft M 1208mm	s
30L	Rudder Shaft L 1462mm	s
30X	Rudder Shaft X 1716mm	s
31	Shaft Ball Race	p19
32	Vane Knob	p1
33	Axis Knob	p1
34	Heading Knob (VXA1)	p1
35	Ratio Rod	s1
36	Drive Rod	s2
37	Vane Bolt Set	s1
38	Axis Bolt Set	s1
39	Heading Bolt Set	s1
40	Axle Screw	s8
41	Tiller Screw	s1
42	Drive Rod Screw	s1
43	Ball Socket Screw	s2
44	Heading Tube Screw	s1
45	Ratio Screw	s2
46	Shaft Collar Screw	s1
47	Axle	s8
48	Tilt Stop Stud	s1
49	Con-rod Bolt Set (OP)	s1
50A	Bobbin Bolt Set/Clevis Pin	s1
50B	Bobbin Igus Bushings	p2
51	Heading Collar Screw	s1
52	Weight Arm Bolt Set	s2
53	Weight Bolt Set	s1
54	Top Frame Stud Set	s2

77	Rudder	p1
78	Bolt Sleeves	p6
79	Frame Case	p1
79B	LED Stern Light	s
79C	Stern Light Bolt Set	s
80	Worm	p1
81	<i>Worm Bearings</i>	p2
82	Grooved Wheel	p1
83	Grooved Wheel Screw	s1
85	Worm Wheel	p1
86	Worm Box (machined)	c1
87	<i>Worm Line Fairleads</i>	p2
88	Worm Box Stud Set	s1
89	<i>Gear Clamp Bolt Set</i>	s1
90	<i>Bearing Washer</i>	p1
91	<i>Remote Line Set</i>	1
92	<i>Worm End Plate</i>	s1
93	<i>Worm End Plate Screw</i>	s1

#### BRACKETS

100	H Mounting Flange	c1
101	H Shaft Clamp Pair	c1
102	H Long Bolt Set	s1
103	H Short Bolt Set	s1
104	H Shaft Sleeve	p1
105	H Swivel Washer	p2
106	E Transom Clamp Pair	c1
107	E Shaft Clamp Pair	c1
108	E Bolt Set	s5
109	E Shaft Sleeve	p1
110	E Stay Tube	s1
111	A Mounting Flange	c2
112	A Stay Tube Clamp	c4
113	A Shaft Clamp	c1
114	A Bolt Set	s11
114B	A Bolt Set - Extendable	s2
115	A Shaft Sleeve	p1
116	A Swivel Washer	p4
117	A Stay Tube	s2
118	A Extend Stay Tube Clamp	c2
119	A Saddle Washer	a2
120	A Fulcrum	a2

Materials: p - plastic s - stainless a - alloy c - casting

Course Setting: Parts in italics are VXA2 only

OP - out of production