

HUNTER 336 OWNER'S MANUAL

TABLE OF CONTENTS

IV. ELECTRONICS

- A. Shore Power Cable Instruction Sheet and Guide
- B. VHF Radio
- C. Depth/Speed Log Instruments
- D. Optional Equipment

V. GALLEY/HEAD SYSTEMS

- A. Water System Operation
- B. Waste Discharge
- C. Water System Pump
- D. Electric Water Heater
- E. Propane Stove
- F. Microwave (OPTIONAL)
- G. Manual Marine Toilet
- H. Macerator (OPTIONAL)

VI. SPECIFICATIONS & TECHNICAL INFORMATION

- A. Hunter 336 Interior Arrangements - Dwg. H33B2612 & 2626
- B. Thru-Hull Locations- Dwg. H33A2628
- C. Electrical Panel Schematic - Dwg. H33B2615
- D. Battery Switch and Shore Power -Dwg. H33B2616
- E. 12V DC System - Dwg. H33B2619
- F. 110V AC System - Dwg. H33B2625
- G. Potable Water System,- Dwg. H33A2617
- H. Head/Waste System - Dwg. H33A2608
- I. Bilge Pump Layout - Dwg. H33A2609
- J. Fuel System - Dwg. H33A2610
- K. Light Bulb Specifications
- L. Pumps Strainers and Filters
- M. Prop Shaft & Stuffing Box Detail Dwg. H33A2618
- N. Steering Gear - Dwg. H33A2614
- O. Rudder & Shaft - Dwg. H33A2613
- P. Emergency Tiller - Dwg. H33A2631

HUNTER 336 B&R RIG

To understand how to tune the B&R rig, first, you should be familiar with the various parts of a basic, single spreader rig, something that most sailors know a bit about. It is comprised of six interconnected parts: mast, spreaders, upper shrouds, lower shrouds, backstay and forestay.

When the rig is correctly tuned the mast will be straight athwartships when under sail. While it may be raked or bent longitudinally to suit the individual skipper's boat handling preference, the mast will not bend sideways.

The upper shrouds, or uppers, keep the top part of the mast, that which is above the spreaders, from moving from side to side. When an upper is tightened it will pull the top of the mast in the same direction as the shroud and will put a bend in the mast at the spreader in the opposite direction from the shroud. Example: when the starboard upper is tightened it will pull the top of the mast to starboard and push the middle of the mast at the spreader to port.

The lower shrouds keep the middle of the mast from bending sideways. If the boat is fitted with fore and aft lowers the mast will also be kept from moving fore and aft.

The forestay and backstay position the tip of the mast in a fore and aft direction. It is possible to rake the mast forward or aft to the desired amount by the correct adjustment of the forestay and backstay.

An improvement upon single spreader rig aerodynamics is to reduce the diameter of the mast by increasing its number of spreaders. The double spreader rig, only slightly more complicated than the single spreader rig, has an intermediate shroud between the upper and lower shroud which functions to keep the mast from bending athwartships.

However, with a conventional two spreader rig, one needs to add an inner forestay and running backstays which complicate sail handling. The inner forestay is generally in the way when tacking. Sails often get hung up on it, slowing the tack down and sometimes requiring crew to go forward to clear the fouled sail. During a gybe, at one point, both inner forestay and running backstays will be slack; the mast will have very poor longitudinal support, and mast failure can result. In heavy weather, if a running backstay or inner forestay comes loose for some reason or is not properly set after a

HUNTER 336 B&R RIG

gybe or a tack, there is a distinct possibility of a mast failure.

The B&R rig is designed to eliminate the inner forestay and backstay, yet allowing the use of a small mast section which will provide for good aerodynamics. The basic difference between a B&R rig and a conventional rig lies in the B&R's use of swept back spreaders and diamonds: diamonds preform the same function as inner forestays, and the swept back spreaders with shrouds eliminate the need for the backstay.

With the B&R rig no rigging has to be adjusted on any point of sail, thereby achieving a safe rig at all times. The performance-minded skipper will benefit from the inherent aerodynamic efficiency and quick-tacking ability of the B&R rig's smaller mast section and swept back spreader arrangement. The cruising sailor, who often sails with minimum crew, will enjoy the safety and comfort of not having to worry about constantly moving about the boat doing and undoing various parts of the rigging.

B&R rigging systems are on boats the world over: world cruisers and racers, OSTAR boats, 2 ton, 1 ton, 3/4 ton, 1/2 ton, 1/4 ton boats and multihulls, wherever one finds sailors who want performance and reliability.

HUNTER 336 SAILPLAN

By sweeping the shrouds and spreaders aft on the Hunter 336 we are able to support the spar in all conditions without the need for a conventional backstay. This means we are free to maximize the mainsail roach size to increase sail area in a location which is far more easily controlled than adding the same or less area to the overlap of the jib. By maintaining a shorter overlap jib we are able to sheet inside the shrouds for a very efficient 11 degree sheeting angle .

The Hunter 336 sailplan not only has greater area than a conventional rig with a 150% LP jib, but is also more efficient due to the higher aspect ratio jib and tighter sheeting angles. This rig configuration is easier to handle, with upwind tacks often being completed without the need for a winch handle.

With the majority of the sail area in the main, sudden gusts can be easily handled by "dumping" the mainsheet which is always at hand to the helmsperson. Therefore, we discourage the addition of large LP jibs to the Hunter 336 as being inefficient and harder to handle.

TUNING THE 336 FRACTIONAL RIG

THE HUNTER 336 FRACTIONAL RIG

The Hunter 336 rig utilizes swept back spreaders and shrouds to support the mast fore and aft as well as transversely. This tripod support system eliminates the need for a conventional backstay allowing the aft component of the shrouds to support the forestay loading directly. Therefore, forestay tension and forestay sag are directly controlled by upper shroud tension. For that reason it is very important that the upper shrouds are as tight as possible. It is also important in this rig configuration that the mast be tuned with a substantial amount of "pre-bend" for maximum rig stability. The following tuning instructions are designed to achieve those goals.

BEFORE STEPPING THE MAST

Install the spreaders on their appropriate spreader bars, being careful to note which is labeled "starboard". The spreaders are custom fit to each spreader bar and are designed to fit snug against the mast wall. To ease the installation, and align the holes, it may be necessary to squeeze the mast together ever so slightly at the spreader base with a large wood clamp or a large, well padded, metal "C" clamp.

Install the rigging to the spar and spreader tip. See Dwg. #H33A2622 . Remove all clevis and cotter pins from the turnbuckles and place the corresponding pins close by the appropriate chainplate and forestay fitting. Open all turnbuckles to the maximum, making sure that there is still enough thread gripping that the turnbuckles don't come apart. Install the Windex instrument, VHF antenna and masthead light and any additional wind instruments on the masthead. The Windex mounts on an aluminum bar extending aft to allow it to clear the VHF antenna. If not already attached to the mast head, this bar may be in the "loose gear" kit. Also make sure that the interior cover plate inside the boat on the overhead liner at the top of the mast compression post is removed to allow access to the mast wiring. It is always wise to pad and tape the tips of the spreaders to prevent them from chafing the mainsail when the main is eased. The spar should be hoisted from a location just above the spreaders. If not already done, run the halyards in the spar using the messenger lines installed. Install the reefing lines, outhaul & mainsheet in the boom. When all the rigging is attached, induce 4" of "pre-bend" by tensioning the diamonds. Make sure this occurs longitudinally only, and that the mast is still straight transversely.

TUNING THE 336 FRACTIONAL RIG (CONT)

INITIAL TUNING

TIGHTEN THE UPPER SHROUDS

With the mast plumb athwartships and the proper amount of rake achieved, tension both main shrouds equally, counting turnbuckle revolutions as you go. As you tighten the mains, the amount of "prebend" will increase as the spreaders push the middle of the mast forward. As this happens, the previously tensioned diamonds will go slack. At this point, tension the lowers and bring the "prebend" back to the original amount and thus remove the slack from the diamonds. Make sure that the lowers are tensioned uniformly so that no transverse curvature is introduced.

TIGHTEN THE FORE STAY

Lift the furling drum and tension the forestay turnbuckle until it is 1/3 to 1/2 closed.

FINAL TUNING

After the rigging is adjusted as above and the mast is straight amidships and has the necessary 4" of pre-bend, continue tensioning the main shroud turnbuckles uniformly each side (counting & matching the same number of half turns) with a wrench and a screw driver until no more tension can be applied without exceptional effort. Do not use any artificial means, such as pipe extensions on the wrench and screw driver, to achieve additional tension. Lift the furling drum again and tension the forestay an additional four to six turns.

CHECKING THE RIG'S TUNING

Check the mast tuning by sailing in medium winds (10-12 knots). Sometimes fine tuning the diamonds and lower shrouds is necessary when the spar is loaded in sailing conditions. Sail on both tacks, sighting up the luff groove to check athwartship straightness. When sailing with full main and jib all the leeward rigging should remain taught.

When mast tuning is complete, install cotter pins in all turnbuckles and tape over sharp edges of the cotter pins with chafe tape.

TUNING THE 336 FRACTIONAL RIG (CONT)

STEPPING THE MAST

During stepping make sure that the electrical wiring for the VHF and mast lights is pulled through the hole in the deck on top of the mast step for connection below deck. After stepping your mast, attach the lower shrouds to the forward holes in each chainplate and the main shrouds to the aft holes. (See Dwg #H33A2620). The turnbuckles should be installed with the cotter pins located inboard. With the turnbuckles still eased all the way, attach the forestay to the stem head fitting. A jib halyard run forward to the "U" bolt in the anchor locker may have to be used to achieve enough slack to connect the forestay. Tension the shrouds to remove most of the slack, making sure that the port and starboard turnbuckles for each shroud pair are tensioned uniformly. When all the standing rigging is attached and the slack removed unrig the lifting hoist. Run the halyards from their exits in the spar through the appropriate block on the mast step, through the deflector blocks and aft through the rope clutches, as outlined on the Running Rigging Drawing (H33A2624). Rig the Boom to the mast and attach the mainsheet & vang.

PLUMBING THE MAST & SETTING THE RAKE

To center the mast athwartships, start with only slight tension on the main and lower shrouds. Check that the mast is centered in the boat by measuring from the masthead to the chainplates with a steel tape measure hoisted completely up the main halyard. Adjust the upper shrouds, easing one and tightening the other, until the measurements port and starboard are exactly the same. If a steel tape isn't available, the main halyard can also be used for this purpose being careful that equal tensions are applied each side. Once the mast is plumb athwartships, check the amount of rake or aft angle on the mast by hanging a weight from the shackle on the main halyard and adjusting the halyard position so the weight hangs just above the boom. On a calm day, with nobody on the boat, this weight should hang 12 to 16 inches aft of the mast. Adjust the main shrouds uniformly, easing or tightening the same number of turns each side, and the forestay to achieve the proper amount of rake.

TUNING THE 336 FRACTIONAL RIG

Induce the desired mast bend by tightening the diamonds. Measure the bend by tensioning a thin string, or the main halyard, along the back edge of the mast. Ultimately, the amount of bend desired depends upon the way the sails are cut but, as a general rule, a calculation based on .07 of the height of the mast above the boom can be used to determine normal mast bend. Therefore, a boat with a mast 50' high from the boom to the tip would have the string approximately $.07 \times 50' = .35'$, or 4", away from the mast when measured half way up. Upper and lower diamonds should be about equally tight, so that you have a nice, even bend in the mast. It is very important that you get the mast straight athwartships at this stage, so that all the bend is in the fore and aft plane. When this is achieved all diamonds should be about equally tight.

STEPPING THE MAST

Step the mast with all shrouds loosely attached. **The spar should be hoisted from a location just below the upper spreaders.** During stepping make sure that the electrical wiring for the VHF and mast lights is pulled through the hole in the deck on top of the mast step for connection below deck. Immediately after stepping your mast, attach the lower shrouds to the forward holes in each chainplate and the main shrouds to the aft holes. (See Drawing #H33B2633.) The turnbuckles should be installed with the cotter pin heads located inboard. With the turnbuckles still eased all the way, attach the forestay to the stem head fitting. A jib halyard run forward to the "U" bolt in the anchor locker may have to be used to achieve enough slack to connect the forestay.

INITIAL TUNING

1. Adjust the forestay to the desired rake. Hunter recommends that you rake the mast aft approximately one degree. With mast height of 60' over deck, this approximately corresponds to a one foot rake. Hang a weight from the main halyard and use this as a plumbob. Tighten the forestay up to approximately 25% of the final tension you will want on it. This means that the turnbuckle on the forestay will be adjusted approximately another 1% of the forestay length to reach its final tension.

2. Up until now all shrouds shall have been slack and the mast straight athwartships. Start adjusting the uppers with an equal number of turns on the turnbuckles on both sides until they are tight. Now the mast bend has increased some, which will be corrected later.

TUNING THE 336 FRACTIONAL RIG

3. Check if the mast is standing perpendicular to athwartships. Use the jib halyard for this. Pull it outboard so that it reaches below the sheerline to one side of the mast, and mark the halyard at the sheerline. Bring the halyard over to the other side, and repeat the procedure. If you find a difference, adjust the turnbuckles an equal number of turns on both sides (in opposite directions) until the mast is standing straight.
4. Tighten the intermediate shrouds equal amounts on both sides until they are almost as tight as the uppers. Sight along the mast, and see that it is straight athwartships. If it is not straight, adjust the intermediates an equal number of turns on both sides of the boat until it is straight.
5. Tighten the lower shrouds until they are equally tight with the upper shrouds. Again, sight along the mast, and see that it is straight athwartships. If it is not, adjust the lowers accordingly. Your mast will now have about the same amount of longitudinal bend as you originally set up, and no bend athwartships.
6. Tighten the forestay to its estimated final tension.

FINAL TUNING

The final test on how well your rig is adjusted comes when you are sailing. Sail upwind with the boat in 10-15 knots of winds. First, adjust the tension of the shrouds. If the leeward shrouds are very loose, take about half the amount of slack out by tightening the turnbuckles, carefully marking down the number of turns for each one. Tack over, and adjust the shrouds on the other side (now leeward side) by the same number of turns. Continue sailing upwind. Sight along the back of the mast. The mast should now look almost straight athwartships. If, however, the mast is straight up to the top spreaders but thereafter falls off to leeward, adjust the uppers on both sides until it is straight.

During this final tuning always adjust both sides in the same way, or else it will be very hard to get the mast straight on both tacks. Try to make all adjustments on the leeward side, and then tack over and make the adjustments on the new leeward side. By doing this you decrease the wear on the turnbuckle threads. While sailing, also check the amount of sag in the forestay. The desired headstay tension depends upon the shape of the jib and the sea & wind conditions.

TUNING THE FRACTIONAL RIG (CONT'D.)

Generally, a tighter forestay will give more pointing ability and a looser forestay more power. As a general guide, the sag should be 1-2% of the headstay length. For a 50' headstay this would translate into 6-12" of sag.

Once your B&R rig is adjusted, you will not have to redo it. If the mast has to be taken down for winter storage, only loosen the forestay until the pins in the shrouds can be taken out. Leave the spreaders on the mast, and do not adjust either the shrouds or the diagonals.

Measure the forestay turnbuckle adjustment carefully before loosening them so that the rigging adjustment can be reset after the rig is put back up.

A good way to store the mast is on top of the boat, with the spreaders pointing down, thereby supporting the winter cover and efficiently keeping snow and water off the boat.