



DOYLE SAILS ETCHELLS

TUNING GUIDE



by sailors, for sailors
doylesails.com



RIG SET UP

MAST PREPARATION: Etchells masts need to be stiff and straight to help support the headstay in fresher conditions as backstay is applied. Older, softer masts can work in light to medium windspeeds, but are too flimsy for heavy air performance. Remember to install jib sheeting marks on the spreaders at 9 and 12 inches from the tip.

PRIOR TO MAST STEPPING: check that your mast is not kinked or that the mast is not hooking off to one side or the other. If it is bent then straighten it side to side or have it bent straight by a professional.

To locate the starting position of the mast step, hold the end of your tape measure near the centerline intersection of the stern deck and the transom. Then run the tape forward over the traveler through the console to the bottom aft edge of the mast. This distance should average from 17' 5.5" to 17' 6.5" (5333 to 5360 mm.) When checking shroud tension at bsse setting, let the mast float at the partner, without the influence of the RAM.

UPPER & LOWER SHROUD CHAIN PLATE POSITION

Once the mast is stepped, attach the upper shroud turnbuckle in the 1st or 2nd hole from the front on the chainplate and the lower shroud in the 4th or 5th hole from the front (don't tighten yet.) The uppers in the first hole is best for stiffer mast and 2nd hole is best for softer mast. The lowers in the 5th hole helps support the mast downwind from bouncing when the mast is fraculated forward. As a reference, when fraculating downwind, the mast can be inverted as much as a mast-width forward when fraculated hard with the jib halyard and the mast touching the front of the partner.

HEADSTAY & MAST RAKE

Before attaching the headstay, hold it taught along the front face of the mast and mark the headstay at the point that corresponds to the upper edge of the black band at the gooseneck. Once you have attached your headstay, adjust your turnbuckle so that the reference mark is 47.5" to 48" (1206.5 to 1219.2 mm) above the deck measured along the forestay. This determines the starting mast rake position.

Ideally, you have an above deck adjustable forestay system or adjust the headstay turnbuckle by removing the clevis pin in the above deck fork-eye connection. This way you can adjust your headstay above deck without having to climb into the bow tank. Your headstay turnbuckle should have only one cotter pin to prevent the barrel from spinning off while sailing. We typically do six full turns for every 1/4 inch (6mm.)

We recommend starting with a base headstay setting 47.75" to 48" (1213 to 1220 mm.) From that base setting,, you can tighten the headstay as much as 3/4" (20 mm) for heavy air and loosen as much as 3/4" (20 mm.) or for light air, We generally use increments of 1/4" in 6 mm adjustments (6 full turns..)

UPPER & LOWER SHROUD TENSION

Now you're ready to tension the shrouds to the base setting. Use the LOOSE PT-2 gauge to check upper and lower tension with enough backstay so that the headstay reads 10 on the LOOSE gauge. Let the mast float at the partner in the neutral position without the influence of the RAM when checking the shroud tension at base setting. Begin by tensioning the upper shrouds evenly so that when you sight the mast slot, it is straight side-to-side. Tighten the uppers to 19 on the Loose PT-2 gauge for starters. Then tension the lowers evenly hand tight, so the mast is straight side to side. The goal is to start with Lowers at a base setting of 13 minus two full turns (for BROGLA or open barrell turnbuckles, take off 3 full turns.). Lowers will read 7/8 on the LOOSE gauge at base setting. **Make sure to tie or lock off your turnbuckles at each setting** while sailing or the turnbuckles could spin off on their own. While sailing, make sure the RAM is cleated securely for each setting to prevent pumping at deck level.

BACKSTAY REFERENCE MARKS

We also like to mark the backstay at deck level as follows: Once the headstay is adjusted to your base setting with upper and lower shrouds adjusted to a base setting, you can then install backstay reference marks. When at the dock or hardstand pull the course backstay so that headstay just comes firm (you'll feel the resistance just as it comes firm). Mark the backstay at deck level where it exits the stern tank. That will be your 10 knot max power backstay reference position. Then with a sharpie marker put another mark up 140mm above that (length of a sharpie marker 5.5"), this is your max backstay mark. We never pull backstay past that mark for max de-power because the mast will overbend and the main will be too inverted. For light air, put a third mark 60 mm below base mark (2.5") and we never ease backstay more than that upwind in lightest air. We find those marks good references for repeating fast and reliable settings.



Team Veracity, 2023 World Champions: AP2 Main, LM-SL 3P2 Jib,

TUNING WHILE SAILING

Unless you are sure what the conditions will be on the race course or it is extremely windy, I generally recommend starting at base setting leaving the dock (19 uppers / 8 lowers .) Remember the Etchells class rules allow you to adjust your shroud turnbuckles, backstay and mast Ram while racing, but prohibits adjustment of the maststep and headstay while racing.

For wind speeds 12 to 13 knots, adjust the uppers up one full turn and lowers two full turns.. For wind speeds below 10 knots, the uppers should be loosened one turn and the lowers two turns for first setting below base. The lowest setting for light air is -2 uppers, -3 lowers below base.

Begin by sailing close hauled with the mainsail and jib sheeted in properly. Next, pull the backstay enough to firm up the headstay. Then you must decide to change a few key adjustments based on the wind speed. Adjust the mainsail tack stop to make sure the luff rope is not too loaded or too loose in the slot below the feeder. Remember that the backstay is to be adjusted for the correct headstay sag in wind speeds under 9 knots.

First make sure the leeward upper is not too slack or too firm while sailing closehauled. The best way to determine the correct rig setting is while sailing with the main and jib sheeted on a close hauled course. The leeward upper shroud should just be firm or nearly firm in each wind speed. If the upper feels too tight, then ease the rig one setting and check the firmness of the leeward shroud again. Conversely, if the uppers are too floppy, then tension the rig one setting at a time and repeat that ratio on both sides until leeward side is not too floppy. If the rig tension is too loose as the wind speed freshens to 15+ knots, the mast will not be straight enough. side to side, and the main will be too full at the mid-stripe.

MAST RAM ADJUSTMENT

Mast Ram at the partners is the next adjustment and probably the most critical because it impacts both the main depth and the headstay sag. If after you have tensioned the backstay to set the desired amount of headstay sag / firmness and the mainsail camber depth looks wrong, then you'll need to adjust the mast Ram at the partners. **Quite simply, if the mainsail looks too full at the lower trim stripe, use the Ram to prebend the mast forward. Typically necessary in lighter wind speeds - inducing more pre-bend that helps flatten the main and sag the headstay to make the boat less bound up in the light spots.** If you find you are needing more than 1" (25.4 mm) of Ram behind the mast, then your mast step may be too far forward. Just as a reference, once you find a suitable position for the mast step in fresher conditions, you do not necessarily have to move your mast step again. Once again, after each mast Ram adjustment, check the jib trim and headstay tension and adjust the backstay accordingly to achieve the proper headstay sag as the wind speed varies so that the jib is set perfectly.

If you have too much Ram prebend, the mainsail will develop overbend wrinkles from the mast toward the clew. In which case, in wind speeds over 10 knots, you'll need to add more Ram aft in the partner or move the maststep forward if you are already fully Rammed aft. As a general rule of thumb in light air, I like to see the wrinkles in the lower luff of the mainsail stop at about 60% camber position, which is the aft end of the window in the main with the outhaul in the upwind position.

SAIL SETTINGS AND CONTROLS

JIB SETTINGS

Jib shape is the most critical on the Etchells. The cross-sectional shape and camber depth is largely affected by headstay tension (the amount of sag.)

To get the most light air performance out of your headsail, you can induce fullness, power and pointing by easing the backstay to sag the headstay a bit more and at the same time slacking (scalloping) the luff tension by easing the adjustable tack. This will help move the extra fullness back to the proper draft position. If you have too much sag in light air, the jib will actually become too distorted and knuckle forward, which defeats the purpose (wrong foil shape.) Ramming the mast forward at deck level also induces headstay sag, even without easing the backstay.

To get the most out of your headsail in a higher wind range, flatten and depower your jib by tightening the backstay, which reduces headstay sag, and at the same time tighten the luff tension at the tack. This will help pull the draft forward again, and prevent the entry from becoming too flat forward and bound up.



JIB LEAD FOR ETCHELLS WITH DOG TRACKS OR INHAUL SYSTEM

The jib DOG tracks should be marked on the cuddy at right angle from the center of the partner at 7 degrees (311 mm,) 8 degrees (357 mm,) and 9 degrees (402 mm.) The default sheeting angle for most conditions is 8 degrees. The jib can be sheeted as close as 7/ 7.5 degrees in max power conditions and as far outboard as 9 degrees in heavy air. In very light air, with the crew sitting in or to leeward (under 5 knots,) the jib car should be positioned further outboard on the DOG Tracks as much as 9/9.5 degrees. Sheeting outboard in very light air keeps the luff tell tales breaking more evenly top to bottom. This is because the tacking angles get wider in wind speeds under 5 knots.

JIB SHEETING

The jib should be sheeted to the marks on the spreader in conditions over 5 knots. To maximize pointing upwind we try to trim the jib as tight as possible without stalling the leech telltale. The jib lead position (Up/Down) on the Dog tracks and fore/aft on conventional tracks should be adjusted so that the foot of the jib is flatter when the tack is bottomed out. **The jib halyard fine tune can be used to raise and lower the jib, which will affect the jib lead angle.** In very light air (under 6 knots, the jib leech can be trimmed as far outboard as 3 inches from the tip of the spreader. This is because, in light air, the headstay is sagging and the tacking angles are also getting wider.

DOWNWIND SPINNAKER WORK

We recommend using the vmg radial for wind speeds under 15 knots. For higher wind speeds, we will use the runner as low as 12 knots. At the weather mark, make sure to release the ram, so when the course backstay is released, the mast can move freely in the partners. Before hoisting, make sure the leeward twing is released and the windward twing is max on. While the spinnaker is being hoisted and once the main sheet is eased a reasonable amount, the helmsman should immediately release the course backstay entirely. The jib can then be dropped easily once the backstay is off, and the spinnaker is fully hoisted, there is no need to ease the outhaul downwind in an Etchells because the mainsails are now fitted with tack strops, which automatically generate fullness as the mainsheet is eased (the outhaul can remain in the upwind position.)

Once the jib is lowered and the fraculator system is attached to the halyard, tension the jib halyard to fraculate and it is recommended to invert the mast in order to achieve the most forward rake. The top boats are fitted with super frac adjacent to or integrated with the jib halyard deflector tackle, or its own dedicated system. It is critical that the jib halyard and jib halyard tail be strong and constructed from heat-set spectra to minimize stretch and avoid failure. Even with the course backstay fully released to the aft tank, the backstay fine also needs to be released to assure the mast is able to get far enough forward. The majority of the fleet generally don't get the mast far enough forward compared with the top of the fleet. We suggest testing your ability to achieve enough forward rake and inversion at the dock prior to sailing. Make sure the backstay pennant is the correct length for the full range of heavy air upwind to max forward downwind.

Feel free to contact Jud or Tomas regarding tuning specifics for your mast.



Veracity, World Champion 2023, Miami, AP2 Main, VMG Radial Spinnaker

TUNING MATRIX

Adjustable ball bearing PKM turnbuckles (finer thread)

Chainplate UPPERS & LOWERS (from the front)	WIND SPEED (knots)	FORESTAY LENGTH (Mark top of the LB to deck)	MAST STEP (from tran- som)	LOOS GAUGE PT-2		MAST RAM (FWD/AFT)	BACKSTAY TENSION (From Base)	OUTHAUL TENSION (from band)	TRAVELLER POSITION (off centre)	JIB CAR POSITION degrees	JIB INHAUL POSITION degrees
				UPPER TURNS	LOWER TURNS						
1/5	3-5	48.75	17' 5.5"	-1	-1	1" fwd	-2.5"	-2"	+12"	9.5	9.5
1/5	6-8	48.5	17' 5.75"	-1	-2	.75" fwd	-1.25"	-1"	+9"	8	8
1/5	9-11	48.25	17' 6"	Base 19	Base 8	.5" fwd	Base POS	-.5"	+3"	7	7
1/5	12-13	48	17' 6.25"	+1	+2	.25" fwd	+1.5"	-.25"	centre	7.5	7.5
1/5	14-15	47.75	17' 6.5"	+1	+2	max aft	+3"	max	-4"	8	8
1/5	16-17	47.5	17' 6.5"	+1	+2	max aft	+5"	max	-8"	8	8
1/5	18-20	47.25	17' 6.5"	+1	+2	max aft	+5.5"	max	-10"	8.5	8.5
3/5	21-23	47.25	17' 6.5"	+1	+2	max aft	+5.5"	max	-12"	8.5	8.5
3/5	24+	47.25	17' 6.5"	+1	+2	max aft	+5.5"	max	-14"	9	9

TUNING MATRIX

adjustable ball bearing BROGLA

Chainplate UPPERS & LOWERS (from the front)	WIND SPEED (knots)	FORESTAY LENGTH (Mark top of the LB to deck)	MAST STEP (from tran- som)	LOOS GAUGE PT-2		MAST RAM (FWD/AFT)	BACKSTAY TENSION (From Base)	OUTHAUL TENSION (from band)	TRAVELLER POSITION (off centre)	JIB CAR POSITION degrees	JIB INHAUL POSITION degrees
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3/5	24+	47.25	17' 6.5"	+1/2	+1	max aft	+5.5"	max	-14"	9	9