DOYLE One-Design
J/24 - Tuning Guide & Updates

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J/24 Tuning Guide

This J/24 tuning guide was written to help you get the best performance from your J/24. It represents years of sailing experience, speed testing, boat to boat training programs.

The measurements and settings included in this tuning guide are ones that we found to be the fastest settings for the J/24 Doyle Sails. Since crew, wind, and sailing conditions vary, you may find different settings that are best for you. However, by following these instructions you can be confident that you are well set up to win the next regatta.

Always remember that besides having a prepared boat, nothing replaces time on the water.

This tuning guide is divided into three sections:
Preparation
Tuning the rig
Sail trim

PREPARATION

Hull: The hull of a J/24 requires little attention once it is faired. You are not going as fast as the boat is capable if you don't have a faired bottom. Wet sand the bottom with 1000 sand paper and 600 for the keel, then clean it with soap before each regatta. (If you moor your boat, you will need a different bottom finish.)

Keel: One of the most critical factors in speed gains are over the keel shape. Move the keel as far forward as the rules allow. Fair to minimum thickness. A well faired keel will provide more lift (better pointing ability) upwind and less drag (better speed) off the wind. If you choose to have your keel professionally faired, your local Doyle Sailmakers loft can direct you to a qualified boat shop in your area.

Rudder: Keep it clean as possible, repair all the damage immediately, especially on the trailing edge.

RIG:

There are several things to do before stepping the mast:

1) Remove the spare genoa halyard.

2) Remove the running light and wiring. Cover the holes with sail number material.

3) Cut mast butt off to the class minimum length (ask your class measurer).

4) Install a small size Windex wind indicator on the back of the masthead crane.

5) Exit the genoa halyard to the lowest slot on the starboard size of the mast. Mount

two Harken Camcleat (one below the other) just below the cut out, pass the halyard to a small ratchet on deck. Exit the main halyard to the lowest slot on the port size.

6) Exit the spinnaker halyard 8 feet above deck level, and mount a cam cleat just below the cut out.

7) Exit the topping lift to the upper slot on the port size.

8) Take off both ends of the boom and replace the outhaul system using a 6:1 Harken micro block system and 3/16" prestretch line.

9) Before stepping the mast, clean it and give it two coats of silicone based marine wax.

WEIGHT:

Crew weight: Race always at maximum weight allowed by the class: 400 kgs. It is better to be heavy in light winds than lighter in high winds, and since the J-24 start to heel in around 8 knots, you will be hiking almost always.

Boat Weight: Remove from the boat every thing and carry only what is required by the rules (each item at minimum weight).

Carrying on board: You spend hours removing things, cleaning the boat, buying lighter shackles and reducing 10 kilos of spare equipment. The day of the race each crew member brings to the boat one bag full of clothes weighting several kilos. Limit what every crew member can bring onboard. You cannot imagine how much 5 bags full of clothes can weigh, when you are only going to race windward-leeward. Be careful on this point.

DECK LAYOUT:

Rule: Simple is fast. Try to place all the cleats as close as possible to the mast. Remove the secondary winches. Use double winch handle pockets and place it in front of the traveler.

Running: Time on time new materials appear in the market. This is what we find as standard in most of the boats.

Item Diameter Length Line

Main Halyard 5/16" (8mm) 62.30 100% Spectra

Jib Halyard 1/4" (6mm) 55.10 100% Spectra

Spi Halyard 1/4" (6mm) 52.50 100% Spectra

Topping Lift 1/4" (6mm) 44.00 100% Spectra

Jib sheet 5/16" (8mm) 42.00 100% Polyester

Mainsheet 3/8" (9mm) 49.00 100% Polyester

Spi sheets 5/16 (8mm) 57.50 Spectra /Polyester

Twing Line 1/4” (6mm) 23.00 8 plait polyester

Vang 5/16 (8mm) 16.70 100% Spectra

Traveler 1/4” (6mm) 6.00 8 plait polyester

Backstay 1/4” (6mm) 31.00 8 plait polyester

Foreguy 1/4” (6mm) 12.30 100% Spectra

Outhaul 3/16” (4mm) 23.00 Prestrech

Jib cunningham 1/4” (6mm) 29.00 8 plait polyester

Main cuningham 1/4” (6mm) 2.50 8 plait polyester

Note: Lines need to be minimum length and minimum size.

TUNING THE RIG

Headstay Length: The headstay length should be maximum allowed by class rules. The measurement is taken from the center of the headstay pin at the hounds to the intersection of the stern/sheer line. The total length should be 8670mm. Because the headstay hole in the bow of your boat is approximately 65mm up from the stem/sheer line intersection, the actual length of the headstay from the centers of each hole, should be 8605mm

You will need to add a toggle to your headstay to bring it up to maximum length.

Mast length: The mast length should be minimum allowed by class rules. Even do this is not the way the measurers are going to measure. Your mast will need to be 8973mm. From the center of the headstay pin at the hounds to the bottom of the stainless base plate. Allow 5 to 10mm to differences in measures and different heights of I beam (ask your measurer about it).

Your shrouds may be to long to get adequate rig tension. If this is the case you may be able to shorten the shrouds by cutting the turnbuckles.

Spreader Angle/Deflection: First cut the spreader length to minimum allowed by class rules, 760mm. Using a string, tie the shrouds to pull the spreaders back as far they will go. Then measure from the string in straight line to aft face of the mast. You will need to get 145 mm. Tape the spreaders ends to protect the spi and genoa.

AFTER STEPPING THE MAST

Butt position: Position the front face of the mast at 2845 mm. measure in straight line from the 3rd bolt of the stem fitting (looking inside forward) to the lower forward face of the mast. Block the mast solid at 2910mm from the stem/sheer line intersection. Adjust the upper shrouds, then measure from the bow to the sides of the boat two equal measure (one in each side) no farther aft than the turnbuckles. With the genoa halyard measure to each mark and find if the mast is center to the boat. Also measure

side to side and find out if the mast is in the middle of the boat.

Using a Loos Tension Gauge, tighten the upper shrouds to 20 and the lowers to 15. Adjust the backstay bridle turnbuckles so that the roller is 10” below the connector plate. With this measure you will need to have 1 1/4” of pre-bend. Tight or loose your backstay until your reach (- 12) in the headstay. This will be the base setting. If you get more than this pre bend move the butt position 1/4” forward. Conversely, if you get less than the suggested pre bend, move the butt position 1/4” aft. You will need to move forward or aft until you get the desired pre bend.

Pre bend is measured holding the main halyard directly to the gooseneck. Measure at spreader height.

FINE TUNING THE RIG - SHROUD TENSION CHART

Your Doyle mainsail is designed to perform in 10 knots of wind with a 1 1/4” pre bend. In heavy air, bend can be achieved through the backstay tension. Backstay tension will bend the upper part of the mast and increase headstay tension, flattening the genoa.

Because we don't want to flatten the genoa in light air conditions, the 1 1/2” of bend must be achieved by prebending more your rig.

Once the wind lightens you will ease shroud tension, this will increase headstay sag, improving pointing ability and gaining power. As the wind picks up progressively, you will tighten the lowers more than the uppers. The lowers will reduce pre bend and stiffen the middle of the mast, so every time you apply backstay tension the upper part of the mast will bend freeing the leech of the main and flattening the genoa, creating an ideal shape for heavy air. When you want to get power ease the backstay again.

SHROUD TENSION CHART

Wind - Knots	Uppers**	Lowers**	Stay**	Genoa*
0- 3	16	10	-12	8”
4- 7	20	15	-12	4”
8-10	23	20	-5	3”
10-12	25	23	-5	2”
13-15	27	26	0	3”
16-18	29	29	+5	6”
+19	31	33	+5	Jib

* Distance from genoa to spreader. If the sea conditions are smooth (flat seas) in winds from 8 up to 16 use 1” less of distance to the spreader.

** Loos gauge Model B.

Tip: Write down on deck this chart with the amount of turns you need to move from one tension to the other.

Genoa tracks: To fine tune the genoa it is important to have extra holes in the genoa track. Drill holes between factory holes.

SAIL TRIM

Once your boat is set up as outlined above, there are three sail adjustments that will affect your speed more than any other while sailing to weather. These are jib sheet tension, mainsheet tension, and backstay tension. If you feel that you are lacking speed, there is 90% chance that one of these three adjustments is wrong. If your are slow, free sheets bearing away a couple of degrees, gain speed and then try pointing.

Genoa trim: Position the genoa lead so when over trimming, the genoa touches the turnbuckles and the sail remains 1" from the spreader. Then free sheet and position the sail following the tuning chart. With the sail in position head slowly toward head to wind, the luff will need to break first in the upper part of the sail (by a second) earlier than the lower part. If the sail breaks even, move the lead back one hole. If the upper part breaks first (by more than one second) move the lead forward one hole.

In light air the halyard should be tensioned for no wrinkles in the luff (nothing more than that). As the wind increase allow wrinkles in the luff, this will move the center of effort of the sail back, improving pointing ability. With more wind, tension the halyard until the wrinkles disappear.

In a practical way, pull up all the halyard, then start easing until the wrinkles start to appear or to the desire point. Do not over tension the luff of the sail. Use the genoa cunningham to fine tune the luff of the sail. If you cannot point, probably will be one of these items: a) An over tensioned genoa sheet. b) To much tension in the genoa luff or c) a loose mainsail leech.

Jib trim: Once the wind picks up over 19 knots, you will need to change to the little jib. Set the lead so the foot touches the foot of the pulpit and the leech remains 2" inside the spreader. If the wind goes over 25 knots move the lead back 1" to tighten the foot of the sail and to open the leech directly to the spreader end.

Also at the first moment, when you change to the jib loosen the shrouds one scale.

Heeling: Upwind never heel more than 10 degrees, if you start heeling more than this start reducing power, only after you are sure that the crew is hiking at max.

Main Trim: Until you start heeling, maintain the boom on centerline. In light winds pull the traveler to windward so the upper batten is 3 to 5 degrees open and the boom is in the center of the boat. As the wind increases, start dropping the traveler and increasing sheet tension.

In 10 knots, The traveler will be in the middle of the boat and you will need to apply more sheet tension so the top batten is pointing 3 degrees to windward. When you reach more than 13 knots star freeing the sheet and start dropping the traveler a bit.

Don't let the boat over heel. If you're used to playing the sheet, you will probably need to apply a lot of Vang tension so every time you free the sheet, the boom will go out instead of up. Don't use the Vang until you start heeling. If it is puffy conditions, use the backstay to depower and power up the boat.

Remember don't try to point until you are at full speed. Also, if the boat heels in a puff don't point to avoid the heeling, free sheet and let the boat run, you will end up forward but in the same line as the boat that points (but goes sideways).

In the run, free the sheet until the luff breaks, or directly to the shrouds (be careful) Set the Vang so the upper leech is parallel to the boom.

Spinnaker: In the runs is where you can gain or lose the most distance, it is time to attack the leaders or consolidate your advantage. The Full Radial spi is a true runner, so you can sail lower than other boats, but you will need to sail taking in mind this point:

- The sail is designed to project maximum area, so don’t pull the pole too far aft. 80 degrees of the apparent wind proves to be faster than the standard 90 degrees. Over 8 knots, sail the boat heeling to windward as much as 10 degrees, you can heel more and start going deeper, but don't do it if you have to steer to much or if you start feeling pressure in the rudder. Bring the pole end of the sail lower than the clew. NEVER allow the tack to be higher than clew. In almost all conditions set the tack to around one foot lower than the clew. Select the ring that gets the pole more perpendicular to the mast.

Use the lower ring for the pole, as long as you can.

HELPFUL HINTS:

1) Sail at maximum crew weight.
2) Sail the boat as flat as possible.
3) Do not pinch.
4) Set the shroud tension for the wind you are expecting in the first part of the race.
5) When in doubt, select the more powerful option (it is easy to depower.)
6) On the runs, heel the boat to windward.
7) On the runs, use as much crew weight as possible to steer the boat.