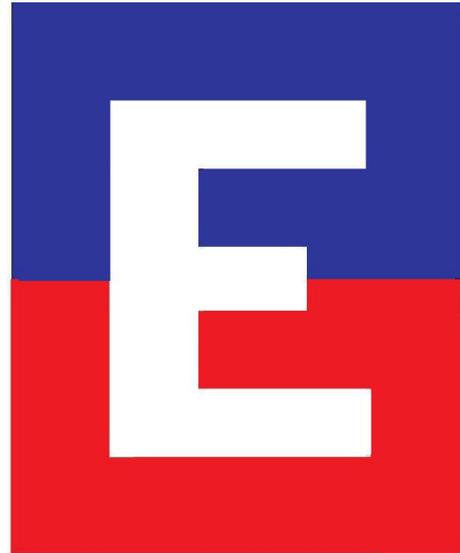


Scantling Rules

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SCANTLING RULES

I. GENERAL RULES

1. Requirements. A yacht, its sails, spars and all equipment, must conform strictly throughout with respect to design, dimensions, construction and material to the official plans and specifications of the NCESA as well as all other Rules and Regulations governing participation in NCESA and other recognized associations' sanctioned events.
2. Interpretations. In interpreting any point not adequately covered, or wording of obscure meaning, the Rules Committee of the NCESA, as the final authority, shall consider the intended meaning, rather than any technical misconstruction that might be derived from the wording, and shall bear in mind at all times the basic principle of the specifications, which is to maintain the class, within reasonable limitations, as standard, equalized, one-design yachts. A request for an interpretation should be made on Form 3 and addressed to the Chairman of the Rules Committee. An adverse decision may be appealed to the Judicial Committee in writing.
Options - Nothing is optional in these specifications unless the word "optional" or "unlimited" appears in the Article and then only within the limitations described. IT IS THE INTENTION OF THESE RULES TO PERMIT ONLY THE MATERIALS, METHODS OF CONSTRUCTION AND HARDWARE SPECIFIED AND NO OTHERS. It is not the intention of these Rules to permit everything not specifically prohibited. Where the number of certain items is specified:
 - A. Number permitted means that the yacht may have not more than the number of items specified.
 - B. Number required means that the yacht shall have at least the number of items specified, and
 - C. Number means that the yacht shall have exactly the number of items specified.
3. Experimentation. The Board of Directors may permit experimentation in such matters under conditions prescribed in Article X of the By-Laws, including participation in sanctioned events by those engaging in such experimentation.
4. Yachts may carry fittings for symmetrical spinnakers, asymmetrical spinnakers, or both.
5. No **Boat** shall be entitled to *race* as a bona-fide E-Scow unless:
 - A. the annual dues have been paid to the NCESA and;
 - B. A current annual NCESA Active Owner Membership Sticker is affixed on the starboard side of the transom.

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II. HULL

1. General
 - A. Shall be made from a mold which complies with the NCESA table of offsets and tolerances. See By-Laws for procedure for obtaining license for mold.
 - B. Materials permitted for new construction or modifications - fiberglass - polyester - vinyl ester resin - epoxy resin - divinycell - klegecell or closed cell pvc foam core. Wood is also permitted as a core material for local reinforcement purposes. The specific intent of this rule is to ban those materials commonly referred to as "exotic". Examples of such material include, but are not limited to: Kevlar - Carbon Fiber - honeycomb core.
 - C. Yachts shall be constructed so that, on a cross-section athwart ships taken at any point, no part of the hull shall be sensibly below the center part of the hull.
 - D. The transom shall be perpendicular (both fore and aft and athwart ships) to the centerline of the yacht.
 - E. Bracing of the hull shall consist of at least three longitudinal members. There shall be two bilge longitudinal structures whose length shall be at least two-thirds of the boat. There shall be a center longitudinal structure extending from within 6 in. of the bow to within 12 in. of the stern.
 - F. All hulls shall be stamped or identified in a permanent manner as to year built, builder and hull number. Any yacht completed and/or delivered prior to October 1st must be stamped with the date of that calendar year. (The purpose of this rule is to identify any hull from all other hulls.)
 - G. All yachts must be equipped with hoist points to permit weighing and launching by crane.

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2. Hull Dimensions
 - A. Measurement Definitions

1. Any rub rail shall not be considered part of the hull dimensions. All measurements are to be taken to the outside surface of the hull material.
 2. Molded depth is defined as the vertical distance at the deepest section taken from the bottom of the outside hull surface of the boat to the top of the outside surface of the deck at the gunwale, at the highest point of the sheer.
 3. Crown of deck shall be measured at the mast line in the center of the deck.
 4. One or more cockpits shall be permitted, but no cockpit shall extend forward of one inch aft of the mast line, or outboard of the bilge board boxes.
- B. Dimensions
1. Length - 28 ft. max., 27 ft. 9 in. min.
 2. Beam - 6 ft. 9 in. max., 6 ft. 6 in. min.
 3. Molded depth - 19 in. max., 16 in. min.
 4. Crown of deck - 6 in. max., 4 in. min.
 5. Hull thickness - ½ in. min. except for areas of high curvature, adjacent to the hull and deck joint, the transom and adjacent to through hull fittings where core is omitted for structural integrity.
 6. Deck thickness - 3/8 in. min.
 7. Rub rail: rail (if used): Maximum ½" radius. Located on the bow and cannot extend aft of the forestay intersect.
 8. Yachts configured for asymmetric spinnakers shall carry a sprit bulkhead located forward from the mast line on the starboard side such that the loads from the sprit are reacted by the through deck fitting and the bulkhead. The bulkhead is positioned square to the sprit.

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3. Bilge Boards and Rudders

Method of measuring location - all measurements of slot or hole location shall be taken along, and following the curve of, the planking outer hull surface. Measurements taken "from transom" should be taken from the aft face of the transom.

A. Bilge board boxes

 1. Number - 2
 2. No part of the slot shall exceed any dimension given.
 3. Width of slot - 5/8 inches plus or minus 1/8 inch. The interior of the board boxes may not be built up to effect a smaller slot.
 4. Slot distance at outer surface from center line - 29 ½ in. max., 27 in. min.
 5. Back of slot shall be ½ in., plus or minus 1/4 in., farther from center line than the front of the slot.
 6. Front of slot distance at outer surface from transom - 14 ft. 2 in. max.
 7. Back of slot distance at outer surface from transom 8 ft. 4 in. min.
 8. Devices (such as blocks of wood) to alter the angle of attack of boards are prohibited.
 9. Bilge boards boxes shall be so constructed that the bilge boards can be wholly housed without leaving any projection below the hull and bilge, boards shall be so hung that in the event of the yacht capsizing, the boards cannot fall from the boxes.

B. Bilge Boards

 1. Number - 2
 2. Extension beyond hull - 46 in. max.
 3. Material - Aluminum alloy plates with properties equal to or better than #6061-T6.
 4. Thickness - 5/16 in. plus or minus .010 inch.
 5. Sectional shape - Flat to within 4 in. of the edge with all edges rounded to no less than 1/32 in. radius.
 6. May be painted, anodized or plated; built up boards prohibited.
 7. The maximum chord of the board measured perpendicular to the leading edge shall not exceed 21.5 in

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- C. Rudder Posts
 1. No part of the post hole shall exceed any dimension given.
 2. Post distance at outer surface from center line - 20 ½ in. max., 19 in. min.
 3. Post distance at outer surface from transom - 41 in. max., 36 in. min.
- D. Rudders
 1. Number - 2
 2. May be made from aluminum plate or foil shaped of fiberglass and foam about an aluminum center plate.
 3. Rudder shafts shall be of solid aluminum with properties equal to or better than #6061-T6 alloy. Shaft diameter shall be 1 in. ± 1/16 in.
 4. Aluminum Rudder
 - a. Extension beyond hull when in fore and aft position 13 in. max.
 - b. Material - Aluminum alloy with properties equal to or better than #6061-T6.
 - c. Thickness - 3/16 in. plus or minus .010 inch.

- d. Sectional shape - flat to within 4 in. of the edge with all edges rounded to no less than 1/32 in. radius.
 - e. May be painted, anodized or plated; built up rudders prohibited. Fillets may be added to the rudder to streamline that joint between the rudder and the rudder post and may not exceed three inches in any direction from the point defined by the intersection of the central line of the rudder post to the top edge of the rudder.
 - f. Outline shape - blade must fit within rectangle 21 in. fore and aft by 12 in. deep.
5. Foil Shaped Rudder. All length dimensions are inches.
- a. Material - Aluminum alloy of minimum tensile strength equivalent to #6061-T6 alloy for the center plate inside rudder. Fiberglass, polyester, vinyl ester, epoxy resin, gelcoat, or LP paint is allowed to fabricate the foil shape of the blade. The coring material is optional. Carbon fiber is not allowed for body or core.
 - b. Weight - Minimum weight per rudder is 3.5 lbs for blade plus shaft.
 - c. Extension beyond hull, and overall rudder span when in fore and aft position shall be 16.0 in. maximum.
 - d. The leading edge, trailing edge, and line of maximum thickness shall be fair curves. Sectional shape shall be a fair foil shape with no hollow more than 0.063. The leading edge shall be rounded to no less than 0.10 radius. The trailing edge may be of squared, circular, or 30 deg. angle cut with cross section of $0.10 \pm .05$ minimum thickness or diameter.
 - e. The following dimensions (in.) at the indicated spanwise offsets shall be met. Semicords are referenced to a spanwise baseline 3.5 in aft of the leading edge at zero span and running perpendicular to the inboard closure plane:

<u>Offset Outboard,</u> <u>(Ref. Inbd. Closure)</u>	<u>Semichord</u> ($\pm .125$) from		<u>Thickness</u> ($\pm .06$)
	<u>Baseline, fwd</u>	<u>Baseline, aft</u>	
0.00	3.50	6.40	1.16
5.90 (150mm)	2.90	6.20	1.07
9.85 (250mm)	2.35	5.60	0.92
13.80 (350mm)	1.20	4.55	0.68

- f. The rudder shaft shall be perpendicular to the inboard closure plane with its centerline on center laterally and 1.1 ± 0.06 in. forward of the baseline.
- g. On existing yachts with rudders that are canted with respect to the rudder post, the inboard closure of the blade may be cut back up to one inch to allow foil shaped rudders to be laid up over the existing cut-down rudders

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- 4. Flotation
 - A. Nineteen cubic feet of flotation shall be added to each new hull.
 - B. Flotation shall be Styrofoam or other material of equivalent buoyancy.
- 5. Weight of Yachts
 - A. Hull weight is measured.
 - 1. Including - mast, boom, spinnaker poles, boards and their line, rudders and tillers, standing and running rigging, hull fittings, flotation, splash boards (if attached), compass, attached bags for handling spinnakers and poles while racing.
 - 2. Excluding - sails, sail flotation panels, life jackets, pump, paddle, cockpit cover, drawer, battens.
 - 3. The boat shall be bailed completely dry and all storage spaces shall be empty.
 - B. The weight of the yacht in this condition shall be a minimum of 965 lbs. However, a 50 lb. allowance is permitted. This allowance shall be made up by the addition of ballast weight, preferably sheet or block lead, which shall be permanently affixed over the keel line located not more than 10 in. below deck or 10 in. either side of the centerline. Starting at the mast line, add lead as required forward but not to exceed 14 in. ahead of the mast. Weight shall be placed so that any rigging led through this area is not obstructed. All yachts constructed in 1972 and thereafter shall have a 1/4 inch diameter drilled to facilitate placement of lead weights.
 - C. All equipment weighed in shall be retained on board throughout an event except as provided in rules governing replacement of damaged equipment.
- 6. Required Safety Equipment
 - A. All safety equipment shall be kept on board throughout an event except when in use.
 - B. The following items of safety equipment are required:
 - 1. Life jackets - one for each crew member including the helmsman.
 - 2. Pump or bailers.
 - 3. Paddle or removable floor board.
 - C. The following items of safety equipment may be required by the sailing instructions:
 - 1. Anchor and line.
 - 2. Other items as required by local conditions or regulations.

III. SPARS

1. General
The original heat treatment and wall thickness of the extruded section shall not be changed nor shall the section be cut or notched in any way to facilitate bending. It shall accommodate a 3/8" bolt rope.
2. Mast
 - A. Number - 1
 - B. Sectional material:
 1. Shall be constructed from an alloy extrusion with 85% min. aluminum content.
 2. Permitted alloys - Properties of the spar material shall not be less than those of ALCOA alloy 6061-T651
 3. Weight - 1.45 lbs. per ft. min. if tapered, and 1.25 lbs. per ft. min. if untapered, sealed section.
 - C. Sectional shape:
 1. Shall be constructed with a continuous fixed groove integral with the spar section to hold the main sail luff rope.
 2. Dimension:
 - (a) Athwart ships: 70 mm (2 3/4 in.) min., 90 mm (3 9/16 in.) max.
 - (b) Fore and Aft (including luff rope groove): 110 mm (4 5/16 in.) min., 130 mm (5 1/8 in.) max.
 3. Tapering
 - (a) Permitted above 22 ft. 6 in. from deck line.
 - (b) Tapering fore and aft or athwart ships or both shall be permitted.
 - (c) Dimensions at peak - athwart ships - 40 mm (1 9/16 in.) min. Fore and aft - 55 mm (2 3/16 in.) min.
 4. The mast line shall be straight both fore and aft and athwart ships when under zero applied pressure. Tolerance - 1 in. aft bend due to permanent set.
 5. Weight. Including all fittings but excluding standing and running-rigging: 48 lbs. min.
 6. Center of gravity (balance point). When rigged as in 5. above - 12 ft. 4 in. above deck line min.
 - D. Sections permitted: The Rules Committee has determined that the following mast sections comply with the above rules:
 1. Tapered or untapered:

(a) Allspar	(b) Holt-Allen	(c) Proctor K
(d) Proctor - minimum Soling	(e) Erickson	(f) Johnson "Jay"
(g) Melges "E"	(h) Melges 1981 and 1991	
(i) Johnson 1981 and 1990		
 2. Prior approval in writing shall be obtained from the Rules Committee before any mast section may be used. Exact specifications and a one foot sample of any extended extrusion should be submitted to the Chairman at least 60 days prior to the date on which approval is required.
 3. New construction or purchase of spars shall be limited to the Melges 1991 spar.
 - E. Mast standing rigging.
 1. General
 - (a) Stays and shrouds shall be 1 x 19 wire cable of diameter specified.
 - (b) Main halyards shall be 7 x 19 flexible cable between the shackle and locking device.
 - (c) Spinnaker halyards and topping lift - unlimited as to material.
 - (d) All stays, shrouds, halyards and topping lift may be internally or externally attached to the mast.
 - (e) Mast intersect shall be measured from the deck line.
 2. Forestay
 - (a) Number - 1
 - (b) Diameter - 1/8 in. minimum except for the tail which penetrates the deck, which shall be 5/32 in. diameter 7x19 wire cable or other material of equivalent or better strength and flexibility.
 - (c) Mast intersect - 21 ft. 8 in. max., 21 ft. 4 in. min.
 3. Main shrouds.
 - (a) Number - 2
 - (b) Diameter - 5/32 in. minimum.
 - (c) Mast intersect - 22 ft. plus or minus 4 in.
 4. Lower shrouds.
 - (a) Number - 2
 - (b) Diameter - 1/8 in. min.

- (c) Mast intersect - 12 ft. plus or minus 4 in.
- 5. Back Stays.
 - (a) Number permitted - 2
 - (b) Material - Any material of any dimension.
 - (c) Mast intersect - same height as main shrouds.*

* Rules Committee clarification of Part V-Scantling Rule III ([Spars](#)) section E (Mast Standing Rigging) sub-section 5.c -Back Stay mast intersect. The rule reads "backstay- mast intersect- same height as main shrouds". The Main Shroud rule -section E.3.c reads that the mast intersect is 22' +/- 4 inches (a range from 21'8" to 22'4"). The Rules Committee interprets the rule to mean that as long as the backstay is within the tolerances of the main shroud rule, it complies with the rule.

The result of the above interpretation is that it is allowable to have the backstay intersect at the same height as the forestay intersect- 21'8" and for the main shrouds intersect to be between 21'8" and 22'4". This will allow the backstay and forestay intersects to be in line with one another, and for the upper shrouds to be at a higher location, but within the tolerances. No changes required.

- 6. Spreaders.
 - (a) Number - 1 set of two.
 - (b) Material - unlimited
 - (c) Length from mast attachment point to the hole or slot for upper shroud - 27 in. plus or minus 3 in.
 - (d) Mast intersect - 12 ft. plus or minus 4 in.
 - (e) May be rigged as free swinging or restricted.
 - (f) In use, main shrouds shall be led through and attached to the spreader so that the spreader will be carried approximately perpendicular to the mast line.
 - (g) One additional pair of spreaders is permitted on yachts rigged for asymmetric spinnakers with diamond stays.
 - i. Length - 16 ± 2 in.
 - ii. Mast intersect - 22' ± 4 in.
- 7. Halyards - See [Rule VII](#). (Methods of Setting, Sheeting and Adjusting Sails).
- 8. Diamond stays - Number required 2 for asymmetric spinnaker configuration.
 - (a) Diameter - 1/8 in. 1x19 wire min.
 - (b) Mast intersect
 - i. At tip - 29 ft, ± 4 inches
 - ii. At base - 2 in., ± 2 inches from the base of the extrusion
 - (c) An additional set of spreaders are permitted. [See 6 \(g\)](#).
- F. Devices permitted for adjusting mast rigging while racing.
 - 1. General - pulleys, sheaves and attachments for halyards and topping lift - unlimited.
 - (a) No strut shall be permitted with any spinnaker halyard.
 - (b) The pulley or sheave for a spinnaker halyard shall be attached directly to or through the mast.
 - 2. General - stays and shrouds shall be adjustable only at end attached to deck except for diamond stays which shall be adjustable only at the end attached at the base of the mast.
 - 3. Forestay - unlimited
 - 4. Main shrouds, lower shrouds, and diamond stays - turn buckles or adjustable tubes.
 - 5. Back stays - block and tackle with max. 8:1 advantage with one end required to be no more than 2:1.
 - 6. Spreaders - none.
 - 7. Halyards and topping lift - See [Rule VII](#).
- G. Mast fittings.
 - 1. General - pulleys, locking devices for halyards, etc. unlimited.
 - 2. Spinnaker pole eyes
 - (a) Number permitted - unlimited.
 - (b) Type of fitting - either sliding or stationary eye or both permitted.
 - 3. Gooseneck - shall be designed with a permanent stop on the mast to prevent the upper edge of the boom (boom line) from extending below the upper edge of the lower black band.
 - 4. Fitting for attaching boom vang and other permitted devices - unlimited, but see [Rule VII](#).
 - 5. Mast step and cup - unlimited, but see [Rule IV-2](#).
- H. Running and standing rigging intersection with deck - [See Rule IV](#).
- I. All masts shall be rigged non-swiveling.

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- 3. Boom
 - A. Number - 1
 - B. Sectional material - shall be an aluminum alloy with properties equal to or better than 6061-T6.

- C. Sectional shape
 - 1. Metal:
 - (a) Shall have a continuous fixed groove integral with the spar section to hold the main sail foot rope.
 - (b) Width - 3 1/4 in. max., 2 in. min.
 - (c) Depth - 4 in. max., 3 in. min.
 - (d) Tapering - prohibited.
 - D. Boom line shall be straight both vertical and athwart ships when under zero applied pressure. Tolerance - 1 in.
 - E. Gooseneck fitting, outhaul device, sheet blocks and vang attachment unlimited, but see Rule VII.
4. Spinnaker Poles
- A. Number permitted - 2
 - B. Material - may be constructed of wood, metal or plastic:
 - 1. If of wood - clear Sitka spruce.
 - 2. If of metal - an aluminum alloy with properties equal to or better than 6061-T6.
 - C. Spinnaker pole shall be constructed so that it will float.
 - D. Sectional shape, tapering and pole end devices - optional.
 - E. The spinnaker pole shall not exceed an overall length of 10 feet.
 - F. Spinnaker pole rings shall not be greater than 3 inches from the mast, however measured.
5. Asymmetrical spinnaker bow sprit
- A. Number permitted - 1
 - B. Material - may be constructed of aluminum alloy or carbon fiber.
 - C. Diameter - 2.25 inch minimum.
 - D. Sectional shape - round with no taper.
 - E. End devices - optional, but tack line cannot be run internally in sprit tube
 - F. Sprit and devices for flying tack line shall not exceed 4 ft beyond bow, measured from the center of the bow, 1/2 inch below the extension of the deck line, directly to the end of the sprit. This distance shall include the end cap and the extension of the eye fitting on the cap. The measurement does not include the rub rail if one is installed.
 - G. Sprit shall not articulate. When sprit is fully extended, forward end shall be on centerline, \pm 2 inches athwartships. When retracted, the outboard end of the sprit and its fittings shall be aft of the forward edge of the hull

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IV. DECK INTERSECTION OF SPARS AND RIGGING

- 1. General

Except where otherwise stated, any rigging may be led to or through fittings:

 - A. On the deck.
 - B. Under the deck.
 - C. Inside the cockpit.
 - D. Through any spar.
- 2. Mast
 - A. Athwart ships - centerline.
 - B. Fore and aft - See Rule V-3.
 - C. Shall meet the deck at a fixed point - no device for altering this point shall be permitted.
 - D. Shall be stepped "on deck" only, with no part of the mast or extension therefrom extending below the deckline.
 - E. All halyards and topping lift may be led through deck if desired.
 - F. The mast step and cup shall not be cantilevered to facilitate the bending of masts, either fore and aft or athwart ships. The step and cup may be designed to prevent the mast from coming unstepped in the event of capsizing.
- 3. Standing Rigging
 - A. Forestay
 - 1. Athwart ships - centerline plus or minus 1 in.
 - 2. Fore and aft - 8 ft. 9 in. max., 8 ft. 7 in., min. ahead of mastline.
 - B. Shrouds
 - 1. Athwart ships - 2 in., plus or minus 1 in. from outer face of hull.
 - 2. Fore and aft - 12 in., plus or minus 4 in. aft of mastline.
 - 3. Upper and lower shrouds shall meet the deck at fixed points. No track or other device for altering this point shall be permitted.
 - 4. Upper and lower shrouds shall meet the deck no more than 2 in. apart.
 - 5. Upper and lower shrouds shall be "on deck" only and shall not be led through the deck.

- C. Backstays
 - 1. Athwart ships - unlimited.
 - 2. Fore and aft - 6 ft. 8 in. min. from transom.
 - 3. Shall meet the deck at a fixed point. No track or other device for altering this point shall be permitted.
- 4. Running Rigging
 - A. Jib sheets, mainsheet, board tackle, boom vang, cunningham, jib tack downhaul and rigging used to adjust position of same - unlimited.
 - B. Spinnaker sheets and spinnaker downhaul - See Rule [VII-4](#).

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V. YACHT DIMENSIONS RELATING TO SAILS

- 1. Measurement Bands or Scribe Marks
 - A. Size
 - 1. On spar - 1 in. wide (in center of white background 3 in. wide where necessary for visibility). Shall completely encircle spar.
 - 2. On deck, the bands shall be 1 in. wide where possible; and 12 in. in length or 6 in. beyond obscuring equipment where possible. Scribe marks molded into the deck shall be of a size or contrast to be easily distinguished.
 - B. Material may be either paint, permanent decalcomanias, or scribe marks molded into the deck. These markings shall be permanently affixed and not removable or adjustable. On metal spars, tape may be used if it is of sufficient quality to make the band permanent and not adjustable.
 - C. Bands marks are required to mark the main hoist, the boom line, the aft end of the boom. Bands or scribe marks are to be used to mark the mastline and the base of the jib triangle. All markings must be in place prior to issuance of a measurement certificate.
 - D. Bands or scribe marks shall be easily visible and distinguished.
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- 2. Dimensions defined (See [Measurement Diagram](#) at Part VII of this Rulebook).
 - A. MAST LINE - The aft side of the mast or its extensions or the aft side of the sail tunnel or its extension, whichever is farther aft. This is interpreted to be a fair profile of the spar or the extension of such profile.
 - B. PEAK - The distance measured perpendicularly from the deck at the aft side of the mast to the bottom of the black band at the top of the mast.
 - C. MAIN HOIST - The distance measured between the lower edge of the upper measurement band and upper edge of the lower measurement band on the mast (boom line).
 - D. BOOM - The distance measured from the mast line where cut by the boom to the forward edge of the measurement band at the end of the boom.
 - E. JIB HOIST - The distance measured perpendicularly from the deck at the foreside of the mast to a point where the luff of the jib, or its extension, intersects the foreside of the mast.
 - F. BASE - The distance measured from the mast line where it cuts the deck to the point where a vertical line through the center of the jib wire attachment hole cuts the deck.
 - G. SPINNAKER POLE - The distance measured between the outermost part of each fitting.
 - H. SPINNAKER SHEAVE WHEEL - The top part of the sheave wheel or the point upon which the spinnaker halyard pivots, whichever is higher.
- 3. Dimensions
 - A. Mastline - 16 ft. ½ in. plus or minus 3 in. from the aft face of the transom.
 - B. Peak - 30 ft. max.
 - C. Main Hoist - 28 ft. 6 in. max.
 - D. Boom - 16 ft. max.
 - E. Jib Hoist - 21 ft. 6 in. max., 21 ft. 4 in. min.
 - F. Base - 8 ft. 6 in. plus or minus ¼ in.
 - G. Spinnaker Pole - 10 ft. max.
 - H. Spinnaker Sheave Wheel - 25 ft. max.
 - I. Asymmetrical Spinnaker Sheave Wheel - 29' 7" max

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VI. SAILS

- 1. General
 - A. All sails shall be triangular. No device to alter the shape of a sail is permitted except a leach cord or pucker string shall be permitted in the leach of the main and the jib, the foot of the jib and the luff and leach of the spinnaker.
 - B. The weight of cloth specified herein refers to a sailmaker's yard (approximately 28 ½ in. width). It is a limitation upon the weight of cloth and not on width.
 - C. Cringles outside diameter - 1 ½ in. max.
 - D. Rings outside diameter - 2 in. max. (rings permitted in lieu of cringles in spinnakers only).

- E. Corner Patches - defined as multiple layers of material, are permitted. No part of the patch shall extend beyond the respective corner measurement point further than the maximum dimension indicated.
- F. The official measurer may use official patterns or templates prepared by him or under his direction, for the purpose of measuring mains. Any sail which does not exceed the dimensions of the template or pattern may be considered to have satisfied the measurement requirements unless a protest is lodged against the sail prior to four hours before the scheduled start of the first race. In the event of any such protest, the sail shall be measured according to these rules, loser to pay the costs thereof. No mainsail shall be disallowed merely because it exceeds the dimensions on the pattern or template; actual measurement according to these rules shall be required before a sail is disallowed.

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2. Main

- A. Weight of material: 3.8 oz. min.
- B. Method of measuring dimensions:
 - 1. General - all tensioning devices (Cunningham holes, leach cords, etc.) shall be relaxed.
 - 2. Measurement points:
 - (a) Head - intersection of inside edge of bolt rope or extension and line perpendicular thereto passing thru highest point of headboard.
 - (b) Clew - end of sail at inside edge of bolt rope.
 - (c) Tack - where luff and foot or their extensions meet.
 - 3. Luff and foot measurements taken from a fair lay of the cloth (no tension).
 - 4. Leach - tension, 5 lbs.
 - 5. Girth; fair lay of cloth (no tension) between two points found as follows:
 - (a) First point is midpoint of luff found by bringing tack and head together, the mid fold being the first point.
 - (b) Second point is the midpoint of the leach, found by bringing head and clew and head together, the mid fold being the second point.
 - (c) Additional girths are found by bringing the tack and head and the clew and head to the midpoints creating quarter fold points.
 - (d) Vertical girth measurement is taken from the head to the midpoint of the foot found by bringing the tack and the clew together.
 - (e) The girth measurement is taken from the inside edge of the bolt rope to the outside edge of the cloth at the leach.
- C. Dimensions:
 - 1. Luff - 28 ft. 6 in. max.
 - 2. Foot - 16 ft. max.
 - 3. Leach - 31 ft. 6 in. max.
 - 4. Girths - Top 5 ft. 10 in. max.; Middle 10 ft. 3 in. max.; Bottom 13 ft. 9 in. max.; Vertical 29 ft. 4 1/4 in. max.
- D. Devices for holding out roach.
 - 1. Main battens - shall divide the after leach in approximately equal parts.
 - (a) Number permitted - 4.
 - (b) Length: Length: top, luff to leach; second, 66 in. maximum; third, 72 in. maximum; bottom, 54 in. maximum
 - (c) Width: 2 in. max.
 - 2. Auxiliary battens - shall be placed approximately midway between main battens.
 - (a) Number permitted - 3.
 - (b) Length - 14 in. max.
 - (c) Width - 1 1/2 in. max.
- E. Headboard.
 - 1. Shall be measured both vertically and horizontally in accordance with the manner in which it is carried. The headboard may not be farther than one inch from the inside edge of the bolt rope.
 - 2. Size - 6 in. max.
 - 3. Flotation - In order to facilitate race operations and prevent damage to equipment, the use of panels may be required. Panels will be available for purchase through the association, encapsulated and fitted with zippers. All sails delivered after January 1, 1987, shall have zipper attachments in a manner so that the panels will be located as near to the head of the sail as practical.
 - 4. Number of holes permitted for attaching main halyard - 3.
- F. Fair Curve - The outside of the leach of the mainsail shall be cut to a fair curve. Lacking a precise definition of a fair curve, the Rules Committee will consider it to be a curve of relatively constant curvature. Abrupt changes in the curvature in an attempt to carry additional sail area in the roach and still maintain the midpoint girth measurement will be considered a breach of the rules and the sail will be disallowed.
- G. Tack - All mainsails must have a single tack and in use it shall be pinned within one inch of the mast line, and one inch of the boom line.
- H. One cunningham hole each for the luff and foot near the tack is permitted.

- I. Windows - Unlimited as to number, size or placement.
- J. Corner patches - defined as multiple layers of material.
 - 1. Head patch: No part of the head patch shall extend below a line parallel with the top batten.
 - 2. Clew patch: No part of the clew patch shall extend above a line parallel with the bottom batten.
 - 3. Tack 20 in. max.
- K. Clew hole - number permitted - 1.
- L. Clewboard - permitted - 4 in. maximum with maximum 90 degree angle between foot and leach (see measurement diagram).
- M. Flutter patch - One patch (multiple layers of material) within a 7" square on the sail leach or 3" wide leach tape extending from top batten to top of sail.

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3. Jib

- A. Weight of material.
 - 1. If of a synthetic fiber - 3.8 oz. min.
 - 2. If of a Mylar laminate 2.1 oz. min.
- B. Method of measuring dimensions:
 - 1. Measurement points - must be in material, not a point in space.
 - (a) Head - end of sail at forward edge.
 - (b) Clew - intersection of leach and foot.
 - (c) Tack - intersection of luff and foot.
 - 2. Luff, foot and leach shall be measured with 5 lbs. tension.
 - 3. Cloth - the head of the jib shall be placed at the head of the Official Jib Measurement Pattern (see diagram at Part VII of this Rulebook) and the luff of the jib shall be stretched along the luff of the pattern. The luff shall be held in place, if necessary, while the leach is measured.
- C. Dimensions - The cloth and headstay attachment shall lie wholly within the profile of the Official Jib Measurement Pattern (including the 90 degree and 140 degree angles at the tack and clew measurement points).
- D. Method of holding out roach:
 - 1. Battens
 - (a) Number permitted - 4
 - (b) Shall be so placed as to divide the leach in approximately equal parts.
 - (c) Top, luff to leach; all others, 30 in. max.
 - (d) Width - 2 in. max.
- E. Headboard - measured both horizontally - 4 in. max., - vertically, 6 in. max.
- F. Windows - unlimited as to number, size or placement.
- G. Corner patches - defined as multiple layers of material.
 - 1. Head patch: No part of head patch shall extend below a line parallel with the top batten.
 - 2. Clew patch: No part of the clew patch shall extend above a line parallel with the bottom batten.
 - 3. Tack 16" max.
- H. Multiple holes in head, in any luff wire and tack - prohibited.
- I. Number of holes permitted in clew or clew board - unlimited.
- J. Clew board - if used shall be at the intersection of the foot and leach. Shall contain corner or break in curvature of 140 degree maximum. Size - 2 inch by 10 inch maximum.
- K. Flutter patch - 3 flutter patches permitted; one each between the jib battens. The patch (multiple layers of material) must be within a 7" square on the sail leach.
- L. Jib leach tape - a leach tape of up to 3" in width will be permitted to reinforce the leach area.
- M. Jib batten pocket - one 6" wide patch, 3" either side of the centerline of the battens will be allowed for the purpose of reducing chafe.
- N. The jib shall be fastened to the head stay.

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4. Spinnaker

- A. Weight of material - ½ oz. min. for 36 in. width cloth.
- B. Method of measuring dimensions:
 - 1. General - adjustable luff or leach cord could be detached or, if not detachable, set at maximum length.
 - 2. All measurements are taken from the center of the ring or cringle at the respective corner.
 - 3. Tension - Luff and Leach, 10 lbs.; Foot 3 lbs.
 - 4. Miter seam - Measurement from head to midpoint of foot found by bringing tack and clew together. Cloth should be pulled taut to form a straight line. No tension.
- C. Dimensions: Spinnakers measured for a regatta shall be one large parachute and one small parachute, or two asymmetrical spinnakers.

LARGE PARACHUTE

1. Luff and Leach - 25 ft. max., 24 ft. min.
2. Foot - 22 ft. max., 20 ft. min.
3. Miter Seam - 28 ft. max., 27 ft. min.

SMALL PARACHUTE

1. Luff and Leach - 25 ft. max., 24 ft. min.
2. Foot - 18 ft. max., 16 ft. min.
3. Miter Seam - 28 ft. max.

ASYMMETRICAL SPINNAKER

1. Luff - 35 ft. 1 in.; +0, -6 in.
 2. Leach - 27 ft. 6 in.; +0, -6 in.
 3. Foot - 20 ft. 6 in.; +0, -6 in. These measurements are measured from the extended vertices of the edge tapes with leach and luff cords relaxed.
 4. Foot Roach - bottom edge of sail within 2 ± 2 in. of a straight line from tack to clew
 5. Mid girth 17 ft. 4 in. ± 3 in.
 6. Material weight - 0.7 oz. minimum
 7. Windows in asymmetric spinnaker, number and placement unlimited. Minimum material weight, 0.7 oz.
- D. Headboard.
1. Shall be measured both vertically and horizontally in accordance with the manner in which it is carried.
 2. Size - 6 in. max.
- E. Corner patches.
1. Head - 32 in. max.
 2. Tack and clew - unlimited.

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VII. METHODS OF SETTING, SHEETING AND ADJUSTING SAILS

1. General
 - A. Sails permitted to be set at one time: One mainsail, one jib and one spinnaker.
 - B. While changing spinnakers, a replacing sail may be fully set and trimmed before the sail it replaces is taken in.
 - C. Damage to sails or equipment - Repairs or substitute equipment may be used in violation of Part VII only to the extent necessary to overcome the emergency.
2. Mainsail
 - A. Equipment permitted for setting, sheeting and adjusting.
 1. Halyard
 - (a) Number permitted - 1
 - (b) Unlimited as to material, shackle, locking devices, etc., but see Rule [III-2](#) & [III-3](#).
 2. Outhaul - unlimited, but shall permit adjustment in horizontal direction only.
 3. Downhaul - unlimited, but see Rule [VI-2-G](#).
 4. Cunningham devices.
 - (a) Number permitted - 2. One for luff and one for foot.
 - (b) Unlimited as to material, camming or cleating devices, etc.
 5. Vang
 - (a) Controlled by block and tackle only.
 - (b) Mechanical advantage - unlimited.
 - (c) May be attached at fixed points only. The Intent of this rule is to prohibit the use of any tack or other sliding devices.
 6. Mainsheet - unlimited.
 7. Pucker string or leach cord - unlimited.
 - B. No mainsail shall be hoisted higher than the edge of the upper black band on the mast. The sail shall be flown between the lower edge of the upper measurement band and the upper edge of the lower measurement band.
 - C. No part of the mainsail shall be carried aft of the forward edge of the black measurement band on the outer end of the boom.
 - D. The top of the boom at the mast or its extension or the top of the tunnel tube or its extension (boom line) may not be carried lower than the upper edge of the lower measurement band on the mast.
 - E. Tack - shall be pinned within 1 in. aft of the mast line and 1 in. above the boom line. See Rule [VI-2-G](#).
 - F. Bolt rope for luff and foot shall be led thru tunnel or groove in mast and boom provided for that purpose. Loose footed sail is not allowed.
 - G. Mainsheet, Cunningham devices and pucker string - no restriction.

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3. Jib
 - A. Equipment permitted for setting, sheeting and adjusting.
 1. Halyard.
 - (a) Number permitted - 1.
 - (b) Unlimited as to material, shackle, locking devices.
 2. Jib boom - none - loose footed jib only.
 3. Tack downhaul - unlimited.
 4. Jib sheets - unlimited.
 5. Luff wire - devices for attaching or adjusting the luff wire are unlimited provided that any adjustable device must have a permanent stop.
 - B. Shall be flown within the fore triangle. Jib overlap as a result of jib tackle trimming or adjustable jib luff is permissible.
 - C. The jib luff wire must be attached to the hull above the deck line at a point not more than 2 in. above deck.
 - D. The jib may not be pulled beyond the end of the luff wire.
 - E. Jib sheet - unlimited.

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4. Symmetrical Spinnakers.
 - A. Equipment permitted for setting, sheeting and adjusting.
 1. Halyards.
 - (a) Number permitted - 2.
 - (b) Unlimited as to material, camming or cleating devices, snap, etc.
 2. Spinnaker sheet - unlimited as to material, snap and cleat or jamming device. Unlimited as to number, but see below as to number permitted in use at one time.
 3. Topping lift.
 - (a) Number permitted - 1.
 - (b) Unlimited as to material, camming or cleating devices and snap.
 - (c) A spinnaker halyard may also be used for the same purpose.
 - (d) For purpose of keeping the topping lift from swinging free when released, a 1/4 in. diameter standard aircraft shock cord may be attached from the snap to the base of the mast.
 4. Spinnaker pole and sheet downhaul - see below and Rule [III-4](#).
 - B. Spinnaker pole.
 1. Number permitted in use at one time - 1.
 2. A spinnaker shall not be set without a pole.
 3. When used, one end must be carried on the mast and shall not be lashed or secured forward of the mast.
 4. Pole downhaul.
 - (a) Number permitted - 1.
 - (b) Unlimited as to material, camming or cleating devices and pole attachment.
 - (c) No more than 2 part mechanical advantage.
 5. Shall be carried on the windward side of the forestay and the jib.
 6. In use shall not rest against any part of the deck or anything except the forestay, jib, jib luff wire or shroud.
 - C. The permissible guys for controlling the spinnaker are:
 1. One topping lift. This pole lift may be attached only at the middle of the pole.
 2. One afterguy (outhaul). This afterguy must be rigged outboard of the shrouds and attached to or run through the outer end of the spinnaker pole fitting. The afterguy must not be secured to the hull or rigging more than 6 in. forward of the mast line.
 3. One afterguy downhaul. This downhaul shall be free-sliding on the afterguy and attached to the deck at a fixed point not more than 6 in. forward of the mast line.
 4. One pole downhaul. Shall intersect the mast or the deck approximately on the centerline not more than 9 in. forward of the mast line.
 - D. The spinnaker may be flown with two clew sheets attached to the sail, but only one may be used actively at one time.
 - E. The spinnaker shall be flown exclusively with the permissible guys intended for such purpose. These rules are intended to prohibit a member of the crew from placing his hands, arms, legs, or body on the spinnaker pole, or on the afterguy forward of the mast for the purpose of tightening the luff of the spinnaker.
 - F. The provisions of this rule apply to flying and adjusting spinnakers. They do not apply to yachts in the act of setting, jibing or changing spinnakers nor to yachts correcting an emergency such as pole jack knife, etc.
 - G. Luff and leach cords and similar devices - unlimited.

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5. Asymmetric Spinnaker
 - A. Equipment permitted for setting, sheeting, and adjusting
 1. Halyards.
 - (a) Number permitted - 1
 - (b) Unlimited to material, camming or cleating devices and snap.

2. Spinnaker sheet and tack line– unlimited to material, snap or cleat or jamming device. Unlimited as to number, but see below as to number permitted in use at one time.
- B. The permissible guys for controlling the spinnaker are:
 1. 2 Clew Sheets, or spliced to be continuous with tail to attach to clew. Only one sheet may be actively used to control the sail
 2. 1 Tack line – method of attaching, cleating and adjusting unlimited.
- C. Bowsprit Use - The bowsprit may be extended on any leg of the course where the asymmetrical spinnaker can be carried solely for that purpose. When rounding the weather mark with the spinnaker not deployed, the bowsprit may not be extended until after the bow of the yacht is abreast of the mark on the rounding tack. The bowsprit must be retracted as part of a continuous process of retrieving the spinnaker. The bowsprit may be extended momentarily, when well clear of other yachts, to assist in clearing a fouled tack line.

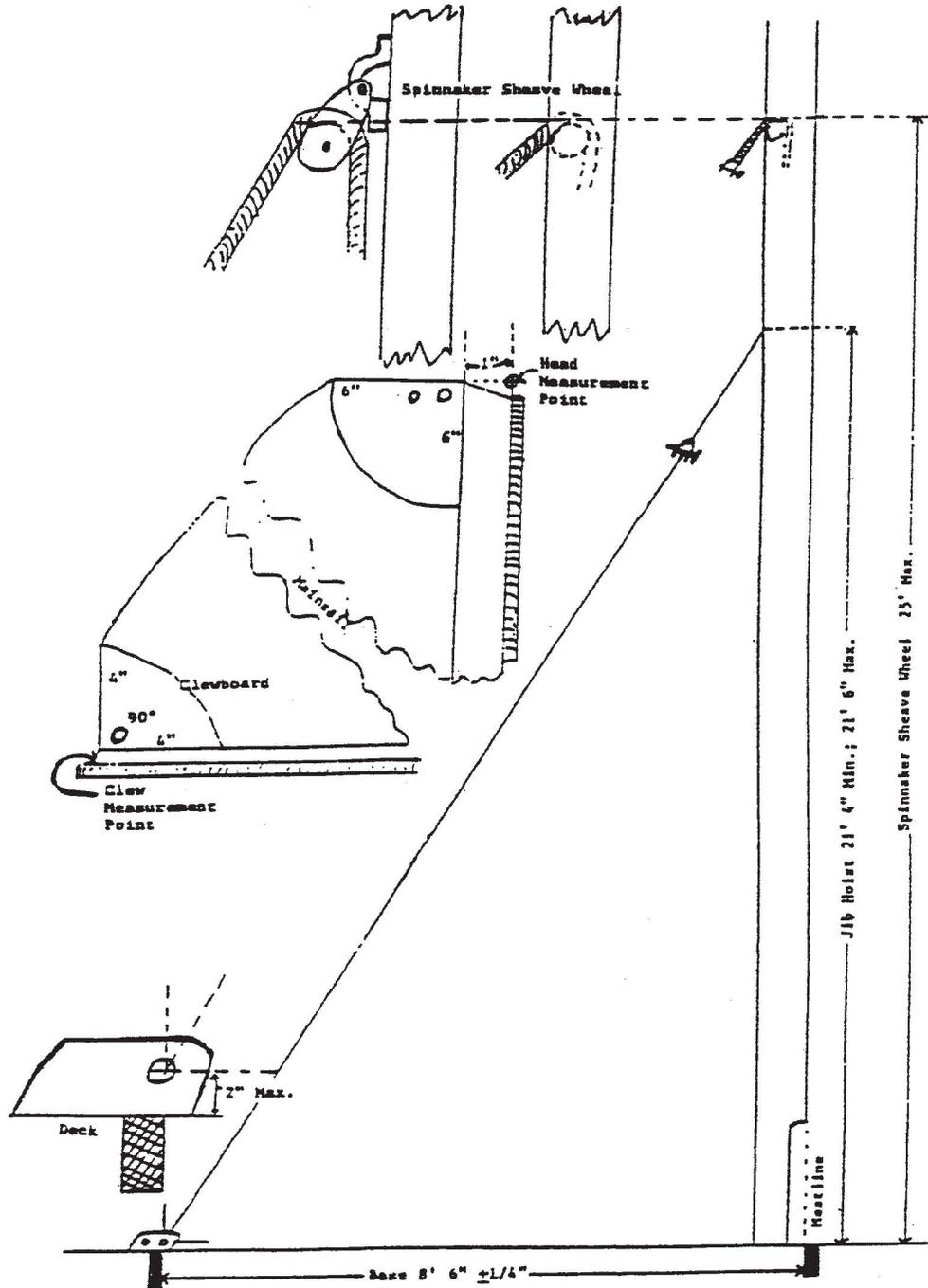
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VIII. BALLAST

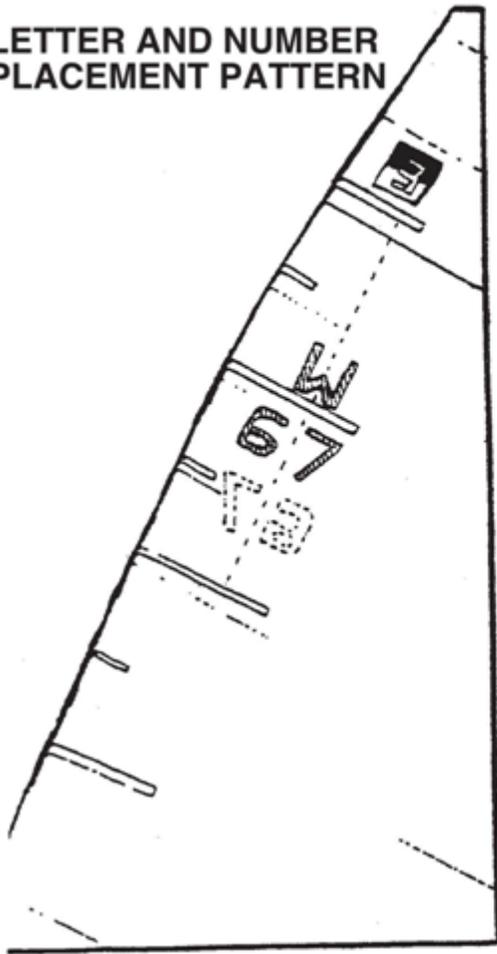
1. General
 - A. Live ballast only may be used.
 - B. The Sections of Rule [VIII](#) are designed for safety as well as to permit various methods of hiking. Any equipment deemed unsafe by the Measurer or the Race Committee will be disallowed whether or not it complies with these rules.
 - C. The Sections of Rule [VIII](#) apply to hiking to leeward as well as to windward and to all members of the crew, including the helmsman.
2. Equipment permitted for carrying ballast outboard.
 - A. Hiking straps
 1. Number permitted - unlimited.
 2. Material - unlimited.
 3. Attachment points - must be fastened below the deck line at two points only, one of which is on the centerline.
 4. Hiking straps are allowed for the sole purpose of applying hiking resistance to the legs (ankles) of the crew and skipper. They are not to used to apply resistance to the back, buttocks, arms, or hands, or in any way simulate a trapeze. Hiking straps may be made to be adjustable subject to these limitations on their use.
 - B. Handrails
 1. Unlimited as to number and material.
 2. Placement - On or sunk into deck only; location - optional.
 3. Shall be designed for hand grip only.
 - C. Rope or line specifically for hiking.
 1. Number and material - unlimited.
 2. Attachment point - one end shall be attached inside or thru edge of cockpit. Other end shall be free. Line shall not pass under or thru any fitting or rigging on deck.
 3. Loops - prohibited. Knot(s) in end or wooden handle attached without loop - permitted.
 - D. Hull, deck hull running rigging, bilge boards and their wells and tackle and other deck fittings not designed solely for hiking.
 - E. Shrouds and backstays (but not other mast rigging) may be used for hiking, from a seated position. When used for hiking, the backstay shall be cleated so that an extension of the line of its upper portion is not outboard of the outside edge of the hull.

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MEASUREMENT DIAGRAM



**LETTER AND NUMBER
PLACEMENT PATTERN**



JIB PATTERN

A Scantling Rule change in 2012 allowed 1/4" to be added perpendicular to the jib luff - not shown in diagram.

