

PHRF OF EASTERN CONNECTICUT

The Performance Handicap Racing Fleet of the Eastern Connecticut Sailing Association

2017 REGULATIONS

REVISED 30 May 2017

Revisions indicated below (Highlighted in yellow) in sections IV and VIII were approved by Council on 30 May 2017 to clarify the use of various staysails while racing in Spinnaker class. Restrictions for the Non-Spinnaker class are also clarified.

In Section IV paragraphs E, and F are so modified.

In Section VIII, paragraph E is added.

If there are questions or concerns, please contact your handicapper.

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I. General Regulations

PHRF base boat ratings are established in accordance with the design of a standard boat, equipped as intended by the original manufacturer and maintained in top racing condition. It is the aim of these regulations to equitably assign handicaps for conditions likely to be found in and about Eastern Long Island Sound. As such these handicaps are only valid when used in conjunction with the following **TIME CORRECTION FACTOR (TCF) = $650 / (\text{PHRF} + 550)$** .

- A **Standard Boat** must be equipped to the degree intended by the manufacturer, including those appointments and equipment supplied or intended by the manufacturer, such as joiner work, cushions, galley equipment, standing rigging, etc.
- A **Custom or One-Off Boat** is reviewed as initially presented on a case-by-case basis, and normally handicapped "as Sailed". Subsequent changes will be treated as a Modified Boat per below.
- A **Modified Boat** is any standard boat that has been changed in some way that might affect its performance from the original design.

While it is accepted that older boats may often require substantial restoration in order to be maintained as safe and competitive, these repairs and improvements can sometimes have the potential to affect boat speed when compared to the base boat upon which the rating is established. It is the same for newer boats that are modified. For this reason modifications and significant repairs made to any boat need to be documented and evaluated, and rating adjustments may need to be considered on a case-by-case basis to maintain fair racing for all.

Modifications of interest typically include changes to the hull shape or structure, appendages, spars or sail plan, boat weight or propulsion. While some modifications may be allowable under One Design class rules where all boats are the same, they may require a rating adjustment for racing under PHRF. For this reason, all restorations, repairs and modifications described below and listed in Section IX of these regulations, whether performed by you, others or previous owners, must be reported and noted on your PHRF application. This applies whether they do or do not replicate the original design. The Handicapping Council assumes the role of assessing modifications to determine whether there is a significant affect on performance requiring adjustment of a boat's handicap. Though only some modifications may require that a rating adjustment be considered, it is not the owner's responsibility to assess the speed significance of a change or to decide which modifications qualify. For this reason we offer the general guidelines below, on what to report (and what not to report) on your rating application.

Modifications and Repairs Which Must Be Reported: (Required)

1. **Hull and Appendages:** Changes that alter either the weight of the boat or the flow of water over wetted surfaces such as size, shape, contour, length, materials, weight, location, center of gravity, etc.
2. **Internal Structure:** All structural work including changes, repairs, additions, or replacement to the original manufactured design and construction of the hull, keel sump, rigging, weight, or weight distribution. This includes (but is not limited to) interior bulkheads, longitudinal stringers, keel sump bracing, tie rods, and compression struts.
3. **Spars:** Changes to weight, length, cross section, design, materials (Carbon Fiber, etc.), external support structure, standing rigging design or materials etc.
4. **Sail Plan:** Guidelines are provided in the ECSA PHRF Regulations, Definitions and Adjustment document for all applicable rated sails, Symmetrical and Asymmetrical Spinnakers, Mainsail and Headsails. Other innovative changes to the sail plan, not covered by the Regulations, must be reported.
5. **Interior Amenities:** Changes that affect weight of the boat including removal or addition of cushions, hatch tops, doors, tables, head, battery, tanks, other furniture or components of basic boat. Replacement of any of these made with lightweight materials.
6. **Mechanical Propulsion:** Changes from original production installation that affect location, weight and/or underwater drag.

Modifications Which Need Not Be Reported: (Not Required)

1. Fairing and Smoothing of the hull, rudder, keel or centerboard that conforms to the original design except as limited by One Design class rules.
2. Additional Sails no bigger than the rated sails.
3. Sail Material such as Mylar, Kevlar, Carbon, Dacron, Nylon, etc.
4. Changes to Running Rigging or additions of sail handling gear such as head foil systems, winches, blocks, sail track, Sheeting arrangement, removal or addition of chokers, outhauls, and Cunningham, mast or boom hardware.
5. Cosmetic Changes to the hull, interior, or rigging of the boat not affecting the weight, trim, or speed of the boat.

It is the **sole responsibility** of each boat owner to advise the ECSA PHRF Handicapping Committee of any modifications or repairs to his/her boat, that in **any way** alters the configuration of the hull, foils, internal structure, sail plan, mast or rigging of the boat or that could potentially affect the sailing performance of the boat-when compared to the rated standard boat.

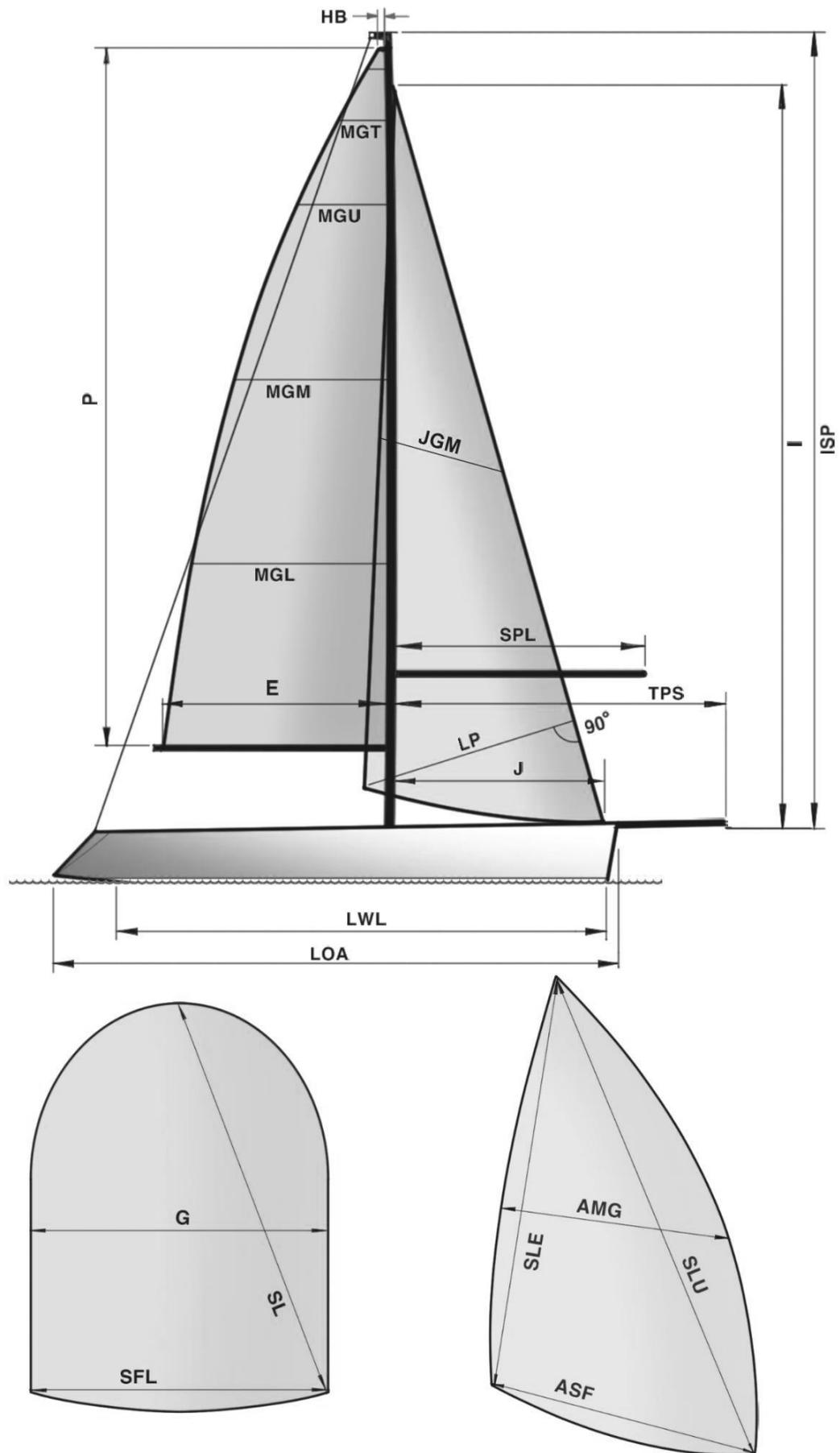
With respect to **performance improvements**, the fairness of PHRF ratings and of the racing that relies on them is entirely dependent on accurate information being provided to the Handicapping Council, and on a boat being maintained to continue her compliance with that rating. ECSA's handicapping council takes that accuracy and compliance very seriously. Failure to report modifications accurately on PHRF rating applications (or failure to have a boat's rating reconsidered after any modifications are made that might affect that rating prior to the next race) is **a clear breach of RRS Rule 78.1**, and may also **violate RRS Rule 2 (Fair Sailing)**. Competitors and Race Committees are encouraged to protest (and Protest Committees to penalize) boats that fail in this regard, and Race and Protest Committees are requested to report any such penalties to ECSA for possible further action, including considering possible disqualification from competition for season trophies. If ECSA finds such violations to be intentional and/or part of a pattern of non-compliance, it may well also consider that behavior or any attempt to cover it up as gross misconduct, and call a hearing to take further action under RRS Rule 69, as prescribed in that rule.

- **To qualify for a handicap**, a boat must be single-hulled and self-righting. The use of movable ballast, a trapeze, hiking straps, hiking boards, or any other hiking aid is not permitted. A boat shall not have more than one current Eastern Connecticut PHRF handicap at any time. Rating changes based on a change in headsail size or a new rated sail will be limited to one per season. Rating adjustments for all hull and rig modifications not covered by the regulations below will be handled on a case basis. A base boat handicap may not be reviewed within 3 years of its last review date. [Note: All dimensions shall be given in decimal feet to two places. Please use: 1 Meter = 3.280833 Feet]
- **Boats with an ODR PHRF rating** must conform to the hull, rig, and sail configuration specified by its One-Design Class. Additional class requirements such as limitations on crew weight, hiking, sail size or materials, number of on-board sails, new sail purchases, etc., will not apply. Practices permitted by the class, but otherwise prohibited by these Regulations, or the Racing Rules of Sailing, such as the use of trapezes or movable ballast, shall not be allowed.

II. Definitions

AMG	Asymmetric spinnaker mid-girth, measured from the midpoint of the luff to the midpoint of the leech.
ASF	Asymmetric spinnaker foot length, measured in a straight line from tack to clew.
ASLIM	Equal to: $1.15\sqrt{(\text{ISP}^2 + \text{TPS}^2)}$.
BAL	Ballast of vessel in pounds.
BEAM	Maximum width of the vessel.
DECK HEIGHT	The height of the sheer line abreast of the mast.
DISP	Displacement of vessel in pounds, without any water, fuel, etc.
DRAFT	Distance from bottom of keel to LWL . Also include draft with board down if a centerboard vessel.
E	Distance from the after face of the mast to the center of the outhaul sheave or band which ever is less.
EC	Calculated value of an E dimension such that max girths become allowable under Section V of these Regulations.
EY	The mizzen correspondent of " E ".
G	Maximum symmetric spinnaker girth measured luff to leech (IMS uses SMW).
I	The distance above sheer line to the point of intersection of the head stay and the mast.
ISP	The distance above sheer line to the highest headsail halyard (if above the intersection of the head stay and the mast).
J	Horizontal base of fore triangle measured from head stay intersection at deck edge to front of mast.
JGM	The length measured between the mid points of the luff and leech of a jib.
LLY	Luff length of the largest mizzen staysail (mule, etc.).
LOA	Length overall of hull.
LP	Distance perpendicular from the luff to the clew of the jib.
LPY	Distance perpendicular from the luff to the clew of the largest mizzen staysail.
LWL	Load waterline length.
MAT	Construction material of the keel or mast, e.g., lead, iron, carbon, aluminum.
Measurements	All measurements shall be in decimal feet to two decimal places [Note: 1 Meter = 3.280833 Feet]
MGL	Mainsail girth measurement from a point along the leech, <u>one-quarter (1/4)</u> of the distance from the clew to the head, to the nearest point of the luff.
MGM	Mainsail girth measurement from a point along the leech, <u>halfway</u> between the clew and the head, to the nearest point of the luff.
MGT	Mainsail girth measurement from a point along the leech, <u>seven-eighths (7/8)</u> of the distance from the clew to the head, to the nearest point of the luff.
MGU	Mainsail girth measurement from a point along the leech, <u>three-quarters (3/4)</u> of the distance from the clew to the head, to the nearest point of the luff.
Modification	Any restoration, repair or change made to a base boat since manufacture as detailed in Section I of these regulations.
P	Height of main luff between black bands or from bottom of upper band to bottom of fixed boom track. (Use top of halyard sheave if no upper band).
PY	The mizzen correspondent of " P ".
Rated Sail	Those sails upon which the handicap is based; specifically the largest Jib/Genoa, Mainsail, and largest Spinnaker.
RFR	Roller Furling Restrained, see Section IV of these regulations for application and limits.
SFL	The length of the foot of a symmetric spinnaker, measured between the clews.
SL	Length of symmetric spinnaker measured along either luff from head to tack, with only enough tension to remove wrinkles. Sail to be stretched flat while measuring.
SLE	Asymmetric spinnaker leech, measured from head to clew, with only enough tension to remove wrinkles. Sail to be stretched flat while measuring.
SLIM	Equal to: $0.95\sqrt{(\text{I}^2 + \text{J}^2)}$, [or $0.95\sqrt{(\text{ISP}^2 + \text{TPS}^2)}$, if ISP is greater than I or TPS is greater than J or both].
SLU	Asymmetric spinnaker luff, measured from head to tack, with only enough tension to remove wrinkles. Sail to be stretched flat while measuring.
SPL	Spinnaker pole length measured from centerline of mast to outboard end of pole when set in a horizontal position, athwart ship.
TPS	Tack Point Spinnaker; the horizontal distance from the front of the mast at its lowest point above the deck to the point of attachment, at deck level, of the foremost tacking point of an asymmetric or symmetric spinnaker or to the extreme forward end of any bowsprit in its maximum extended position. If an asymmetric spinnaker is flown from a pole, TPS is equal to SPL . TPS replaces former terminology referring to JSP.
WPL	Whisker pole length. Measured similarly to SPL

Ila. Definitions



III Handicap Adjustments Non-Spinnaker Handicap

Non-Spinnaker handicaps are based on the ratio of mainsail size (including mizzen sails, if applicable), to fore triangle size as follows:
Ratio = $(P \times E + [PY \times EY] + [0.6 \times LLY \times LPY]) / (ISP \times TPS)$.

<u>Ratio</u>	<u>Rating Adj.</u>	<u>Ratio</u>	<u>Rating Adj.</u>	<u>Ratio</u>	<u>Rating Adj.</u>
.3 but less than .4	+26	1.2 but less than 1.3	+17	2.2 but less than 2.4	+8
.4 but less than .5	+25	1.3 but less than 1.4	+16	2.4 but less than 2.6	+7
.5 but less than .6	+24	1.4 but less than 1.5	+15	2.6 but less than 3.0	+6
.6 but less than .7	+23	1.5 but less than 1.6	+14	3.0 but less than 3.4	+5
.7 but less than .8	+22	1.6 but less than 1.7	+13	3.4 but less than 4.0	+4
.8 but less than .9	+21	1.7 but less than 1.8	+12	4.0 but less than 4.0	+3
.9 but less than 1.0	+20	1.8 but less than 1.9	+11	5.0 but less than 6.0	+2
1.0 but less than 1.1	+19	1.9 but less than 2.0	+10	6.0 but less than 7.0	+1
1.1 but less than 1.2	+18	2.0 but less than 2.2	+ 9	7.0 + greater	0

Non-Spinnaker handicaps **for cat-rigged** vessels shall be equal to their Spinnaker handicap **minus** 6 seconds per mile.

IV. Headsails

A **Jib** shall have a mid-girth, (**JGM**) which is not more than 50% of its foot length. The length of any intermediate girth shall not exceed a value proportionate to its distance from the head of the sail. No headsails may be set to extend aft of the LP line used to establish the handicap.

Limitations on Jibs

- A. Jibs must be sheeted from only one point on the sail except while in the process of reefing.
- B. Jibs must be tacked on centerline.
- C. No headboards shall be used.
- D. Battens may be used only if the LP is 117% or smaller. The number of battens is limited to four, which must be arranged with approximately equal spacing between the head and clew. There is no limit on batten length.
- E. Only one headsail shall be flown at any one time **from the head stay** (except during a sail change).
- F. **All headsails must have the luff fully attached to the head stay and** No headsails may be set to extend aft of the LP line used to establish the handicap.
- G. No headsail (including stay sails) may be flown that has an LPG greater than the rated LP.

Roller Furler Restrained (RFR) A boat, not subject to One Design or Class rules, which sails with ALL head stay jibs that are tacked to the top of an above deck mounted functional roller furler, and are raised within a head foil (excluding inner stays or free flying staysails), using a head stay swivel such that the sails can be furled, shall be considered "Roller Furler Restrained" (RFR).

Boats that are sold by the original manufacturer in the RFR configuration, upon which the base boat handicap is established, are referred to as an **RFR Base Boat**. All other boats, whether equipped with a roller furler or not, are referred to as a **Non-RFR Base Boat**. In all cases, owners **MUST specifically** indicate their configuration in the application process.

The RFR adjustments are as follows:

<u>Sailing as</u>	<u>Spinnaker Class</u>		<u>Non-Spinnaker Class</u>	
	<u>RFR</u>	<u>non- RFR</u>	<u>RFR</u>	<u>non-RFR</u>
RFR Base Boat	0	-3	0	-3
Non- RFR Base Boat	+3	0	+3	0

Headsail Adjustments

NOTE Headsail handicap adjustments **shall not apply** to boats with one-design ratings. For unmodified series production boats use the **design "J"** dimension when determining the adjustment

Spinnaker Class

<u>LP/J Size Range</u>	<u>Rating Adjustment</u>
Up to 1.10	+7
Greater than 1.10 to 1.20	+6
Greater than 1.20 to 1.30	+5
Greater than 1.30 to 1.35	+4
Greater than 1.35 to 1.40	+3
Greater than 1.40 to 1.45	+2
Greater than 1.45 to 1.51	+1
Greater than 1.51 to 1.55	0
Greater than 1.55 to 1.60	-1
Greater than 1.60 to 1.65	-2
Greater than 1.65 to 1.70	-3
Greater than 1.70 is adjusted proportionally.	

Non-Spinnaker Class

<u>LP/J Size Range</u>	<u>Rating Adjustment</u>
Up to 1.10	+16
Greater than 1.10 to 1.20	+13
Greater than 1.20 to 1.30	+10
Greater than 1.30 to 1.40	+ 7
Greater than 1.40 to 1.48	+ 4
Greater than 1.48 to 1.51	+ 1
Greater than 1.51 to 1.55	0
Greater than 1.55 to 1.60	- 1
Greater than 1.60 to 1.65	- 2
Greater than 1.65 to 1.70	- 3
Greater than 1.70 is adjusted proportionally.	

V. Mainsails

Unless standard for a class, unpenalized mainsail girth shall be limited as follows:

Headboard shall not exceed the greater of 0.04E or 0.5 feet.

MGT (7/8 leech) shall not exceed 0.22E

MGU (3/4 leech) shall not exceed 0.38E

MGM (1/2 leech) shall not exceed 0.65E

MGL (1/4 leech) shall not exceed 0.90E

Individual girth or headboard dimensions that exceed the standard fraction of actual E, MUST be declared and will be addressed on a case-by-case basis. IMS Rule 826 will be used for guidance. If actual E or EC is greater than standard E, a penalty of up to 2 seconds/mile may be assessed for each 5% or fraction thereof in excess.

VI. Asymmetric Spinnakers

An **Asymmetric Spinnaker** is defined as having unequal leech (**SLE**) and luff (**SLU**) lengths that differ by more than 5%, and a mid-girth (AMG) of not less than 75% of its foot length (**ASF**).

Sprit-Flown If a boat model comes standard from the manufacturer with a sprit, the base boat rating will be based on the largest standard asymmetric spinnaker, as specified by the boat manufacturer. Additional sail area will be penalized at the rate of 1 second per mile for each 2.5% increase, or fraction thereof, in sail area.

Pole-Flown An **AMG** of up to 180% x J and an average of the leech and luff lengths $((\text{SLE}+\text{SLU})/2)$ not exceeding **SLIM**, shall be permitted without penalty. Oversized sails and poles will be penalized using the same methodology as for symmetric spinnakers, except that **AMG** shall be substituted for **G**, and the average of the leech and luff lengths will be substituted for **SL**. Symmetric Spinnakers may also be flown from the pole on a boat utilizing this configuration.

Centerline or Retrofit Sprit Asymmetric spinnakers may be flown from the deck, or an extension thereof, with a pennant not exceeding 2 feet in length, or from a **non-articulating retrofit sprit**, and will receive a handicap adjustment as follows:

<u>TPS / J %</u>	<u>Rating Adjustment</u>
Less than or equal to 100%	+9
Greater than 100% to 108%	+6
Greater than 108% to 116%	+3
Greater than 116% to 124%	Zero
Greater than 124% to 132%	-3
Greater than 132% to 140%	-6
Greater than 140%	-9

Boats electing this configuration shall be allowed an **AMG** of up to 180% x **TPS**, and an average of the leech and luff lengths ((**SLE+SLU**)/2) not exceeding **ASLIM**, without penalty. Oversized sails will be penalized using the same methodology as for symmetric spinnakers; substituting **AMG** for **G** and **TPS** for **J**, and the average of the leech and luff lengths will be substituted for **SL**.

NOTE: Boats electing this configuration **will not** be permitted to fly spinnakers from a traditional spinnaker pole, and vice versa.

Code Zero Spinnakers Code 0/Close Reaching Spinnakers, are designed to fill a hollow in the polar diagram. They normally have an area of about 60% of a full sized asymmetric and are effective in 40 to 80 degrees apparent wind. These sails are characterized as being made of a laminate or aramid material and have a substantial luff rope for the large luff tensions that these sails require. For handicap purposes, Code 0 spinnakers shall be treated as an asymmetrical spinnaker. Battens are not permitted and they shall be sheeted from only one point. Currently no handicap adjustment is offered for a Code Zero Spinnaker.

VII. Symmetric Spinnakers

A **Symmetric Spinnaker** shall have a mid girth(**G**) that is greater than 75% of its foot length (SFL) and be symmetrical about a line joining its head to the center of its foot.

Spinnaker rating adjustment is based on the largest spinnaker measured by the **G/J** ratio and the **SL/SLIM** ratio. A luff length equal to **SLIM** is standard. The maximum girth without penalty is equal to 1.8 x **J**. If spinnaker luff length is greater than standard, excess length is converted to excess girth. Convert the excess luff to excess girth using the following formula: **G/J** Rated = (**G/J** Actual) (**SL/SLIM**).

Girth Adjustments for Symmetric Spinnakers

G/J	<u>Rating Adjustment</u>
Up to 1.80	0
Greater than 1.80 to 1.85	-1
Greater than 1.85 to 1.90	-2
Greater than 1.90 to 1.95	-3
Greater than 1.95 to 2.00	-4
Greater than 2.00 to 2.05	-5
Greater than 2.05 to 2.10	-6
Greater than 2.10 will be adjusted proportionally.	

Maximum Spinnaker Pole Length (SPL) Without a Penalty

For spinnakers where **G** is less than or equal to 1.8 x **J**, **SPL=J**.

For spinnakers where **G** is larger than 1.8 x **J**, **SPL=G/1.8**.

If **SPL** exceeds both **J** and **G/1.8**, use the Girth Adjustment Tables (substituting 1.8 **SPL/J** for **G/J**) to determine pole penalty.

The spinnaker/pole penalty shall be the greater of either the girth penalty or the pole penalty.

Whisker Poles Whisker poles must be declared, but there is no whisker pole length (**WPL**) limit.

Mast Height Adjustments

(Only applicable when "I" & "P" change equally.)

Standard Mast Height is "I"

Excess or deficient height is measured by mast ratio. Mast Ratio= Actual "I"/Std. "I"

<u>Mast Ratio</u>	<u>Rating Adj.</u>
Greater than 0.91 to 0.93	+12
Greater than 0.93 to 0.95	+ 9
Greater than 0.95 to 0.97	+ 6
Greater than 0.97 to 0.99	+ 3
Greater than 0.99 to 1.00	0
Greater than 1.00 to 1.03	- 3
Greater than 1.03 to 1.05	- 6
Greater than 1.05 to 1.07	- 9
Greater than 1.07 to 1.09	-12
Greater than 1.09 to 1.11	-15
Greater than 1.11 is adjusted proportionally.	

Engine or prop too small to drive vessel at KTS = 0.8 (1.3√LWL)

-6
(Not applicable if temporary engine outage.)

Propeller Adjustments

<u>Inboard Engine</u>	
2 or 3 blade folding or feathering	0
Solid 2 blade aperture	0
AutoProp	+ 3
Solid 2 blade exposed to water	+ 6
Solid 3 blade in aperture	+ 6
Solid 3 blade exposed to water	+12

Outboard Engine Propellers

Std. retracted when racing 0

Engine not retracted, prop immersed on both tacks:

2 blade	+ 6
3 blade	+12

VIII. Additional Non Spinnaker Regulations

- A. The intent of non-spinnaker racing is that boats sail off the wind with the same sails they use to sail on the wind. Therefore, ketches and yawls may not fly staysails off the wind unless such sails are used when sailing upwind.
 - B. Except when changing headsails, participating yachts rated as a sloop, may only fly one headsail at a time.
 - C. Yachts that are permanently rigged as a Cutter may fly a staysail. The inner forestay shall be set up at all times.
 - D. Any boat, not subject to One Design or Class rules when sailing in a non-spinnaker class, is eligible for a handicap adjustment.
 - E. **All headsails must have the luff fully attached to the head stay.**
- See the Roller Furler Restrained adjustments in **Section IV** above.

IX. Boat Modifications

Proper Racing Trim:

Yachts shall race as rated with at least all the equipment and furnishings supplied as standard by the manufacturer. A yacht that has altered or has removed bulkheads, permanently attached furniture, or structural interior components shall be considered a custom or modified yacht. Drawers, headliners, cabinet and locker doors, steps, ladders, and engine enclosures shall remain in place as supplied as standard equipment. If they do not so remain, then the yacht shall be considered a modified yacht and rated accordingly.. Lifting keels (not designed to be adjusted while racing) must be fixed and locked in the lowered position while racing.

Modified Structure:

All after market structural work must be reported by the applicant and reviewed by the Council on a boat-by-boat basis. Refer to **Section I** above for guidance regarding what needs be reported. When possible, we recommend that plans be reviewed with your handicapper before work is started. Alternately, documentation of modifications previously completed by you or others, should include as built photographs and/or as-built drawings with notes on materials and dimensions.. All modified boats will be reviewed and assessed on a case-by-case basis.