

SLVYRA PHRF HANDICAP SYSTEM



The SLVYRA PHRF system is a rating system designed to serve the handicap racing needs of racer-cruiser monohull sailboats. Characteristically, these will have outside ballast for self-righting, cabins, inside living equipment, engine and propeller. The SLVYRA PHRF system is adaptable to many variations from this general theme, however, up to a certain limit. Thus, unballasted monohulls and multihulls have such different sailing characteristics from the ballasted monohull racer-cruisers that handicapping them to race together is very difficult. SLVYRA prefer to use separate PHRF handicap lists for unballasted monohulls, for multihulls and for ballasted monohull. SLVYRA also recommend separating results for each of these types of sailboats in joined regattas. The SLVYRA handicap lists for unballasted monohulls and multihulls are available on the SLVYRA website under "Handicaps; Dinghy's and Multihulls"

PHRF ratings are based on a "standard class boat" to which is fitted a "standard class rating".

A. DEFINITION OF "STANDARD CLASS BOAT":

1. Is built to a single design of which the manufacturer has made, or intends to make, a number of copies with nearly identical hulls and nearly identical rigs.
2. Has external ballasted keel as designed;
 - a. Some boats are designed with retractable keels, or retractable ballasted centerboards. These are acceptable as standard parts of a PHRF standard boat if kept locked down at all times while racing.
 - b. Some boats are designed with ballast inside the hull plus daggerboard or centerboard, which may be entirely unballasted. This is acceptable as PHRF standard if the daggerboard or centerboard is locked down at all times while racing.
3. Has displacement as designed.
4. Has **I**, **ISP**, **J**, **JC**, **P** and **E** dimensions as designed.
5. Largest jib has **LP** = 1.55(**J**).
6. Has mainsail with standard **P** and standard **E**, where **E** is measured horizontally and is assumed at 90 degrees to **P**.
7. Largest spinnaker has Girth (**G**) of 1.80(**JC**), and luff length, **LLS** = $0.95\sqrt{[(\mathbf{ISP})^2 + (\mathbf{JC})^2]} = \mathbf{ISP}$ (approx.). The top of the spinnaker halyard sheave is at the upper end of the **ISP** dimension. If top of spinnaker halyard sheave is placed higher than top of **ISP**, the **H** dimension must be taken and a rating adjustment will be made per section H par.3 and shown coded in the 5th digit, under "S".

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8. Spinnaker pole length = **JC**.
9. Is equipped with engine and propeller and fuel tanks.
10. If Inboard Auxiliary Engine: has folding or feathering propeller, propulsion assembly sufficient to drive boat at 90% of "hull speed" in flat water. Hull speed defined: V (knots) = $1.33\sqrt{\text{LWL}}$ (ft.)
11. If Outboard Auxiliary Engine: Installed on permanent mounting, permanently connected to securely fastened fuel tanks, completely retracted but ready for instant immersion, propulsion assembly sufficient to drive the boat at 90% of "hull speed" in flat water.
12. Fuel onboard sufficient for two hours running at 90% of hull speed.
13. Has inside fittings and equipment as intended by the manufacturer. This may include all or part of the following: Head, sinks, stoves, icebox, navigation desk, berths, lockers, shelves, drawers, table, doors, curtains, instruments, domestic water, plumbing, wiring, fuel and water tanks, etc.
14. Has outside equipment required by safety regulations of the National Authority and also equipment intended by the manufacturer. This may include all or part of the following: ground tackle, lifelines, pulpits, pushpits, life preservers, emergency signalling equipment, fire extinguishers, self-draining cockpits, waterproof decks and cabins.
15. The PHRF standard class boat excludes hiking aids (straps, trapeze, planks)
16. For boats without lifelines such as *Soling*, *Etchells*, *Star*, the PHRF standard class boat is defined with skipper and crew in a normal seated position.

B. GENERAL PHILOSOPHY ON RATING ADJUSTMENTS:

Although many sailboats vary from the definition of "standard" above, it is not intended that these be barred from PHRF racing or penalized or that boats will be forced to recut sails or alter. Instead, rating adjustments will be made proportionately to the speed changes caused by "non-standard" variations. Thus, ratings will be adjusted proportionately "faster" for non-standard variations which cause the boat to sail "faster" and proportionately "slower" for non-standard variations which cause the boat to sail "slower".

Some typical adjustments are as follows:

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Modified Standard Class Sailboats: Common variations which may call for rating adjustments are:

- "Faster" because:
- larger than standard sails
 - significantly altered rigging
 - significantly altered keel or hull
 - significant removal of interior or exterior equipment ("stripping")
 - propulsion does not meet criteria in section A. 9, 10, or 11.
 - less than standard displacement

- "Slower" because:
- smaller than standard sails
 - more than standard displacement
 - IB propulsion with solid propeller
 - OB propulsion with immersed propeller
 - conversion from OB to IB

One-Off/Custom/Non-Class Sailboats: These are rated individually as there is no "standard class". However, to develop the code that goes along with "non-class" rating, the handicappers approach should be to develop a rating which would be a "standard" class rating if there were a class and then thereafter make rating adjustments for variations from the assumed "standard".

Ballasted "bare" boats such as *Soling*, *Star*, *Dragon*, *Etchells*, *Six Meter*, etc. These by intent of the manufacturer are devoid of much equipment as described in section A. Standard class ratings for these boats take this into account. Standard class ratings in other words, are "faster" than they would be if the boats had the missing equipment. "Bare" boats may vary from "standard" and, if so, rating adjustments should be made proportionately to changes in boat speed.

C. RATING CODE:

The purpose of this Code is to show the factors on which the rating is based. A typical rating code is 6355A.

First Column	Second Column	Third Column	Fourth Column	Fifth ** Column
JIB	SPINNAKER	MAIN	PROPULSION	MISCELLANEOUS
6*	3	5	5	A

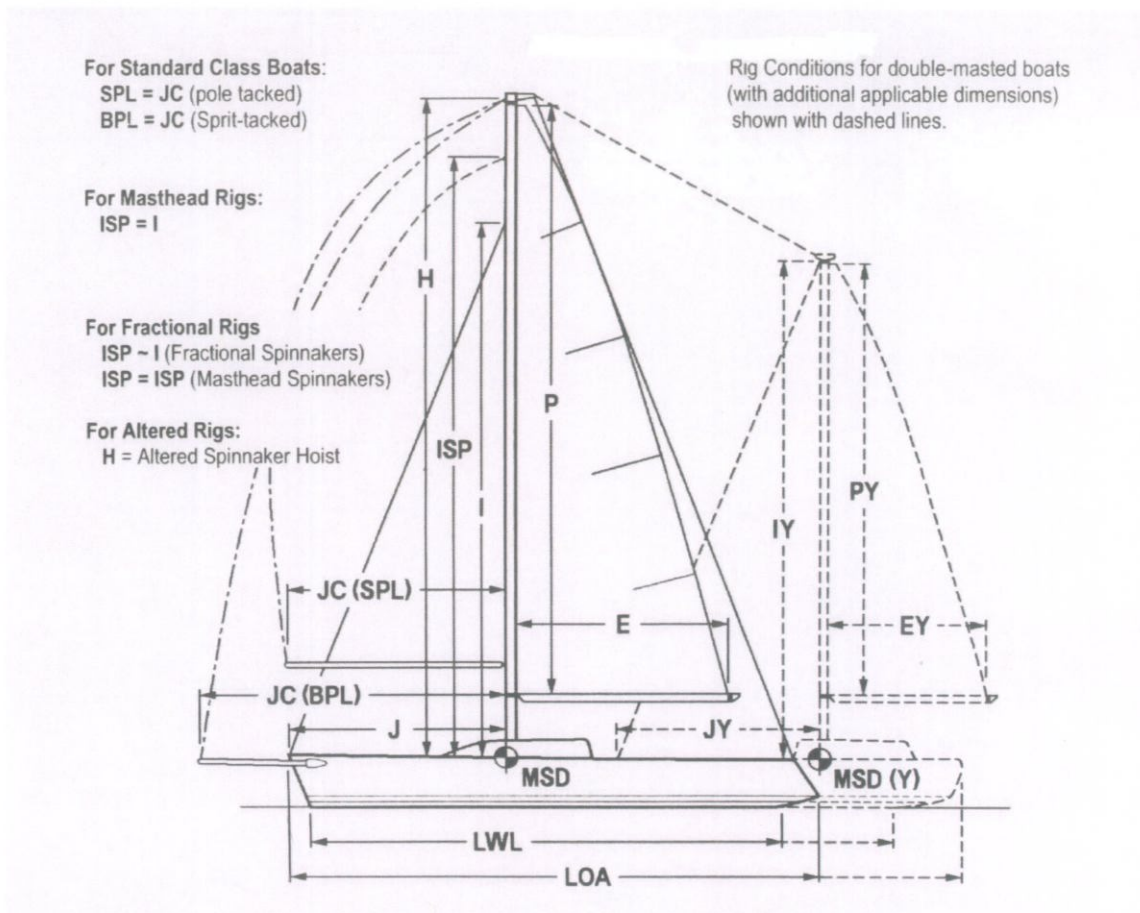
* For the meaning of the symbols appearing in each column space see text hereafter.

** The fifth column space usually will not be occupied, but may be used by a letter representing a miscellaneous adjustment, where such is required. In the event of more than one miscellaneous item, additional Code columns will be shown in the sixth, seventh, etc. column.



D. RIG AND SAIL AREA TERMS AND DEFINITIONS:

STANDARD CLASS RIG DIMENSIONS



- "MSD" MAST-TO-SHEAR DATUM. The height of the deck used as datum shall be taken as 4% of beam above the shear line abreast of the mast
- "I" AS-DESIGNED headsail hoist height measured vertically from the **MSD** to the intersection of the head stay, or its projection, with the forward face of the mast.
- "ISP" AS-DESIGNED spinnaker hoist height measured vertically from the **MSD** to the top of the spinnaker halyard sheave.
- "J" AS-DESIGNED fore triangle base length measured horizontally from the **MSD** to the point where the head stay or its projection intersects the shear line abeam of the point of stay attachment. For boats with bowsprit stays, the shear line shall be projected to determine the point of intersection.

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- "**JC**" AS-DESIGNED spinnaker foot rig length measured horizontally from EITHER the **MSD** to the tack point on the forward end of a fully extended bowsprit pole OR from the forward face of the mast to the tack point of a mast-mounted spinnaker pole in standard position. For stem head-tacked spinnakers, **JC=J**.
- "**E**" AS-DESIGNED mainsail foot length measured from the after face of the mast to the forward edge of the boom clew measurement band.
- "**P**" AS-DESIGNED mainsail hoist measured vertically from the inside edges of the tack and head mast measurement bands.
- "**SPL**" Spinnaker pole length. The horizontal distance measurement of the spinnaker pole, when in its fitting on the mast and set in a horizontal position athwart ships, measured from the center line of the yacht to the extreme outboard end of the pole and fittings used when spinnaker is set.
- "**BPL**" Bowsprit pole length. The horizontal distance measurement of a fixed or fully extended, telescoping bowsprit pole from the **MSD** to the pole's forward tack point, wherein the tack point shall be taken as the forward-most point of a pole fixed tack sheave or the centerline of an articulating pole tack fitting.
- "**WPL**" Whisker pole length. The horizontal distance measurement of the whisker pole, set in a horizontal position athwart ships, measured from the center line of the yacht to center of clew cringle (or D ring of clew) of the jib to which whisker pole is attached.

ALTERED RIG DIMENSIONS

- "**H**" ALTERED spinnaker hoist height measured vertically from the **MSD** to the top of the altered spinnaker halyard sheave.

MEASURED SAIL DIMENSIONS

MAINSAIL

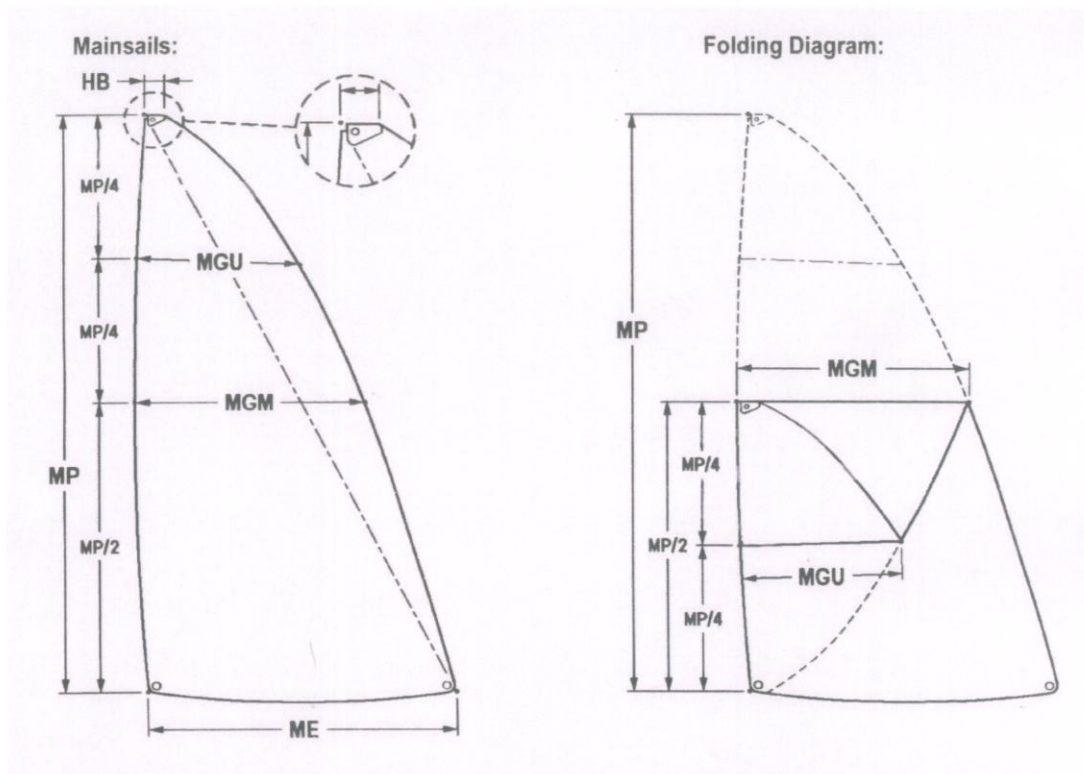
- "**ME**" MEASURED mainsail foot length from tack to clew measuring points.
- "**MP**" MEASURED mainsail luff length from head to tack measuring points.
- "**HB**" MEASURED mainsail headboard length from after top edge of the headboard to the head measuring point.

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"**MGM**" MEASURED mainsail mid-girth (1/2 girth) length from luff to leech mid-girth measuring points.

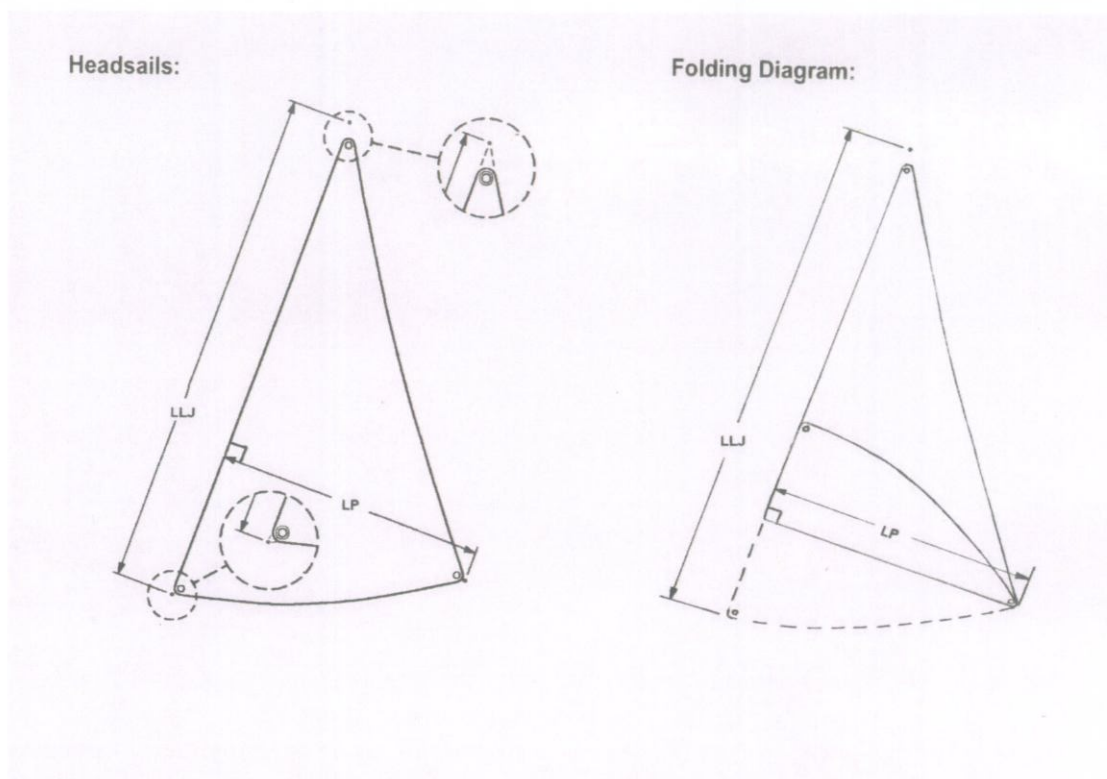
"**MGU**" MEASURED mainsail upper-girth (3/4 girth) length from luff to leech upper-girth measuring points.



JIB / GENOA

"**LLJ**" MEASURED headsail luff length from head to tack measuring points.

"**LP**" MEASURED headsail perpendicular length from clew measuring point to forward edge of the luff.



SPINNAKER

Symmetric

"**LLJ**" MEASURED symmetric spinnaker luff / leech length from head to tack measuring points.

"**Gmax**" MEASURED symmetric spinnaker maximum horizontal girth between luff and leech edge.

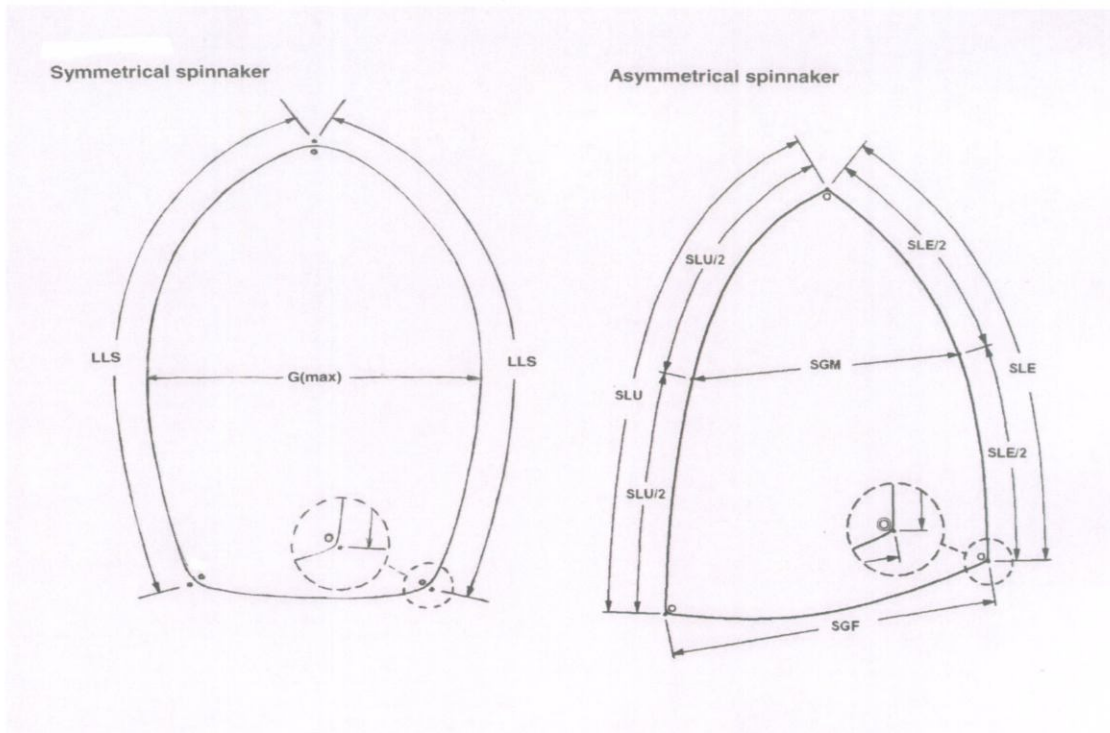
Asymmetric

"**SLU**" MEASURED asymmetric spinnaker luff length from head to tack measuring points.

"**SLE**" MEASURED asymmetric spinnaker leech length from head to clew measuring points.

"**SGM**" MEASURED asymmetric spinnaker mid-girth (1/2 girth) length from luff to leech mid-girth measuring points.

"**SGF**" MEASURED asymmetric spinnaker foot length from tack to clew measuring points.



E. SAIL AREA FORMULAS: (Summary)

STANDARD SAIL AREAS: (Standard sail areas are denoted by “STD”)

Use the Standard Dimensions **I**, **ISP**, **J**, **JC**, **P**, **E** from SLVYRA’s “Standard Handicap and Dimension” list. This list is available on the SLVYRA website under “Standard Handicap and Dimension”

$$\text{STD Jib Area} = (1.02)(I)(1.55)(J)/2 = 0.790(I)(J)$$

$$\text{STD Symmetric Spinnaker Area} = (0.87)(ISP)(1.80)(JC) = 1.566(ISP)(JC)$$

$$\text{STD Asymmetric Spinnaker Area} = (0.77)(ISP)(1.80)(JC) = 1.386(ISP)(JC)$$

$$\text{STD Mainsail Area} = 0.59(P)(E)$$

$$\text{STD Average Headsail Area} = 2/3(\text{STD Jib SA}) + 1/3(\text{STD Spin SA})$$