Note: The diagrams come out best if you use a 300dpi printer setting

NATIONAL TWELVE

DEVELOPMENT CLASS

FULL MEASURERS MANUAL

FOR USE IN CONJUNCTION WITH LATEST CLASS RULES AND
RELEVANT ISAF RULES & RYA PRESCRIPTIONS

This Edition issued with effect from 1st January 2007.
See update history on following page.

UPDATE HISTORY

Issue / Rev	Description	Effective
Issue 1 Rev 0	From JLS draft of 17/11/88. Major updates to include all changes to issue. Re-ordering to match updated measurement sequence.	1/3/93
Issue 2 Rev 0	Updated to include rule changes effective 1/1/95 and 1/1/96. Some re-ordering to match revised measurement sequence.	1/1/96
Issue 3 Rev 0	Updated to include rule changes effective 1/3/97, 1/3/98 and 1/3/99.	1/3/99
Issue 4 Rev 0	Updated to include rule changes effective 1/1/2000, 1/2/2002 and 1/3/2003.	1/3/2003
Issue 5 Rev 0	Updated to include rule changes effective 1/5/2004, 1/5/2005, 1/4/2006 and 1/1/2007.	1/1/2007

CONTENTS

The contents follow the sequence of the Class Measurement Form. The manual must always be used in conjunction with the latest Class Rules (issued by Class or RYA and usually effective from 1st March of each year). Some rules are self explanatory and are not covered in this manual.

CONTENTS (continued)

INTRODUCTION

This manual is designed to help measurers interpret the Class Rules consistently and fairly. Where appropriate the measurement sequence is also described, since this can save considerable time. The following points should be borne in mind before and during the measurement of a Boat and rig.

1. Time

Allow sufficient time for the job:

- A whole day for a complete boat
- One hour for sails and rig.

2. Help

Insist that the owner helps you.

3. Location

Choose a location with enough room and shelter if the weather is inclement.

4. Payment

Agree payment terms with the owner before you start.

5. Owner's preparation

Check the owner has a measurement form, Sail number and that the boat is ready, complete with coloured bands, correctors and all fittings.

6. Measurer's preparation

Check you have all the equipment, latest rules and Manual - see Check List.

Note: The equipment and measurement methods suggested in this manual are for guidance only. Individual measurers will develop and adopt their own preferred methods, possibly utilising equipment from other classes.

7. Rule interpretation

The rule interpretations shown in this manual are in accordance with standard practice. However, never argue about the rules with the owner. If you are unsure about any aspect of the boat's legality, contact the Class Measurement Liaison Officer in the first instance. Sketch and note all details for later reference.

8. Measurement Form

Completion of pages 2,3 & 4 of the Measurement Form is optional but does provide a comprehensive checklist and the sequence is a logical way of measuring a complete boat. The manual follows this sequence.

The first page of the Measurement Form must be completed by both parties at the time of measurement. The measurer must copy the measurement data on this page into his/her notebook in case the

Form is lost. All measurement activities should be recorded in this book.

9. ISAF/RYA authority

The Class Rules, applicable ISAF Rules, and the RYA's prescriptions to them are the only requirements that apply. The RYA is the final arbiter in the event of disagreement. Inevitably, in a development class, the assumptions used in compiling the Measurement Manual will be challenged. The measurer must be open minded if presented with an unusual design. However, paragraph 7 applies.

10. Organisation

During measurement, form a base for all equipment. The boot of your car is good. A work study will often reveal that 90% of the time is spent looking for the tape measure!

11. Measurement accuracy

Try to be accurate with measurements, but remember that most of the Rules have one-sided tolerances, i.e. so long as the measurement is the correct side of the maximum or minimum, the precise dimension is immaterial. However, there are some measurements which must be noted because they influence subsequent measurement points, e.g. overall length to give the Midlength position. These are highlighted in the manual. Linear measurements are always rounded down for minimum dimensions and up for maximum dimensions. Never to "the nearest mm".

12. Safety

Be safety conscious at all times. Boats are heavy and sometimes sharp. The RYA does not want to lose its no-claims bonus on your insurance!

13. Further information

More information may be found in:

- ISAF Racing Rules of Sailing (RRS), and the RYA prescriptions thereto (RYA publication YR1).
- RYA publication YR6 ‘Yacht & Sail Measurement’, including ISAF ‘Equipment Rules of Sailing’ (ERS), ISAF ‘Guide to Sail Measurement’ (GM) each with RYA prescriptions.

Note that the precedence in the event of conflict is:

1. **The Class rules prevail**.
2. RRS.
3. Finally, YR6 gives a lot of useful information and includes some helpful definitions. The RYA prescriptions (at the front) provide some useful guidance on Datum Lines and Points. At the time of writing, YR6 has no ‘legal’ standing.

WEIGHING AND MARKING OF CENTREBOARD AND CORRECTORS

Rule: 8

1. All Up Weight - Rules 8.2 & 8.4

Ensure that the weighing gantry or building is secure before you put the Boat and Mast on the scales. Don't forget to allow for the weight of the sling(s) when zeroing the scales. The sling(s) must provide three lift points, with adjustment on one to allow the Boat to be levelled - or at least lifted off the ground! Alternatively use a purpose made strongback with gunwale hooks. The Boat must be dry and all cordage and loose fittings removed in accordance with Rule 8 i.e. weigh the Boat before the buoyancy test! The weighing should be carried out in sheltered conditions and allowance should be made for wooden boats drying out in long hot summers. Ensure that the accuracy of the scales has been checked by an appropriate Inspectorate within the last 12 months.

2. Centreboard - Rule 8.3.2

Take the Centreboard out and weigh it separately. Mark (impress e.g. with centre punch or drill) the weight of the board on it in a position visible when housed.

3. Correctors - Rules 6.2.3 & 8.3.2

Remove and weigh each corrector. Mark (preferably by impressing) the weight of each corrector on it permanently. Also check that the correctors are located above the approximate waterline.

4. Record

Record the above weights on the Form or Certificate. Check that they comply with Rule 6.2 & 8.1.

Measuring Equipment: Large scales, sling(s) or strongback, centre punch and hammer, small scales.

MAST WEIGHT, CENTRE OF GRAVITY and SPREADERS/CROSS TREES

Rules: 8.1, 9.2

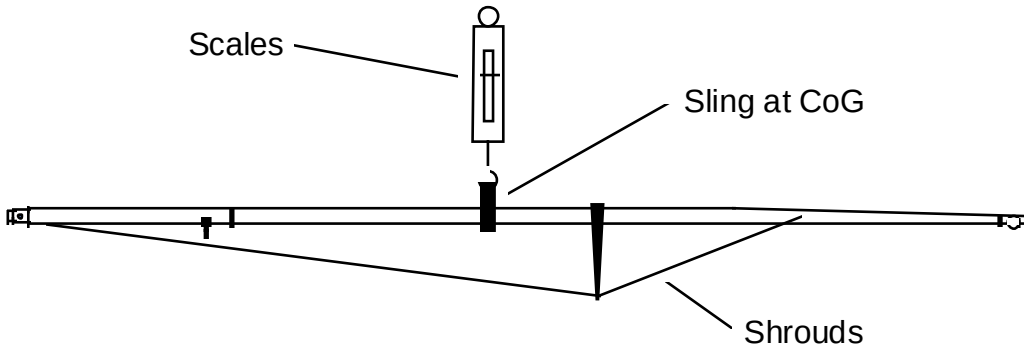
1. Weighing the Mast Rule & Marking Centre of Gravity Rule 8.1

Before the Mast is stepped, weigh it using small scales. Use a small sling to find the balance point and mark this point to enable its height to be checked later under Rule 8.1.2. Tie the shrouds and other rigging down the length of the Mast with the halyards located in the sailing position and the tails suspended below the sheerline or at the foot if this is above the sheerline. Ensure that the jibstick and other items not to be included have been removed. Check the total weight exceeds the minimum required by Rule 8.1.1. Determine the minimum weight of mast that could be used with the boat (hull, centerboard boom etc.) as defined in rule 8 for the all up weight rule to be met.

2. Spreaders or Cross Trees - Rule 9.2

Inspect the Mast to ensure that the rigging is supporting the Mast by no more than one set of spreaders/cross-trees/diamonds or other type of compression strut.

2. Diagram



4. Record

Record the actual mast weight on the mast as descried in rule 8.1.1. The minimum allowable mast weight for the boat to reach the all up weight as described in rule 8 shall be calculated and marked on the boom and certificate or form as described in rule 8.3. Note the number recorded can not be less the minimum mast weigh described in rule 8.1.1

Measuring Equipment: Small scales, sling or strop, Indelible felt tip.

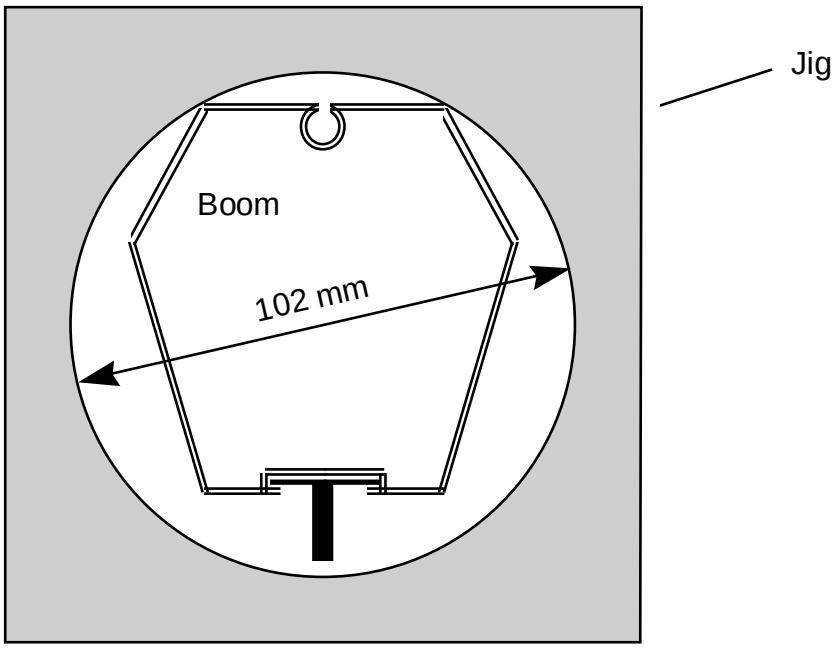
BOOM DIAMETER

Rule: 9.3

1. Checking the diameter

Pass the Boom through a circular jig (see diagram), or callipers set to 102mm. Removable fittings can be taken off for this check, but fittings which are normally fixed/required (e.g. kicking strap anchorage, clew outhaul traveller etc.) are included.

2. Diagram



Measuring Equipment: Circle jig or Callipers.

LENGTH OVERALL

Rule: 4.1

1. Measuring Length Overall

The overall length must be determined exactly as the Midlength position is required for Rules 4.3.3, 4.4.1 and 5.3.1.

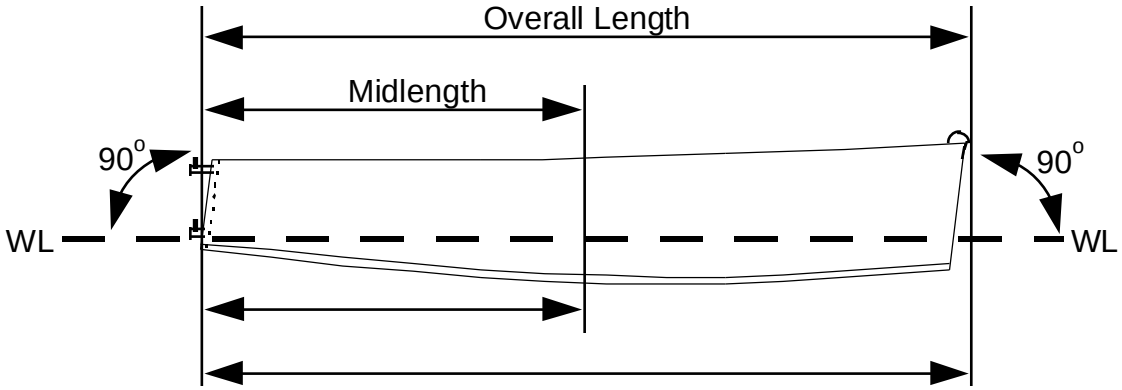
The overall length includes the stem band (if fitted) but excludes normal rudder fittings within 60mm of the centreline of the Boat (Rule 4.1.1) and permitted closing devices for Transom openings (Rule 4.1.2).

You cannot assume that either the extreme aft edge of the hull shell (or Transom if not inset) or the Stem are vertical to the waterline, or parallel to one another. Therefore it is necessary to determine the approximate waterline and to have an easy method for adjusting the fore and aft trim of the Boat. With conventional Hulls the waterline can be assumed to run from the base of the extreme aft edge hull shell / Transom to a point some distance up from the base of the stem. If you are in any doubt about the true waterline, load the Hull with weights to represent sailing trim and mark the waterline with waterproof tape or crayon. (This can be the prelude to the buoyancy test).

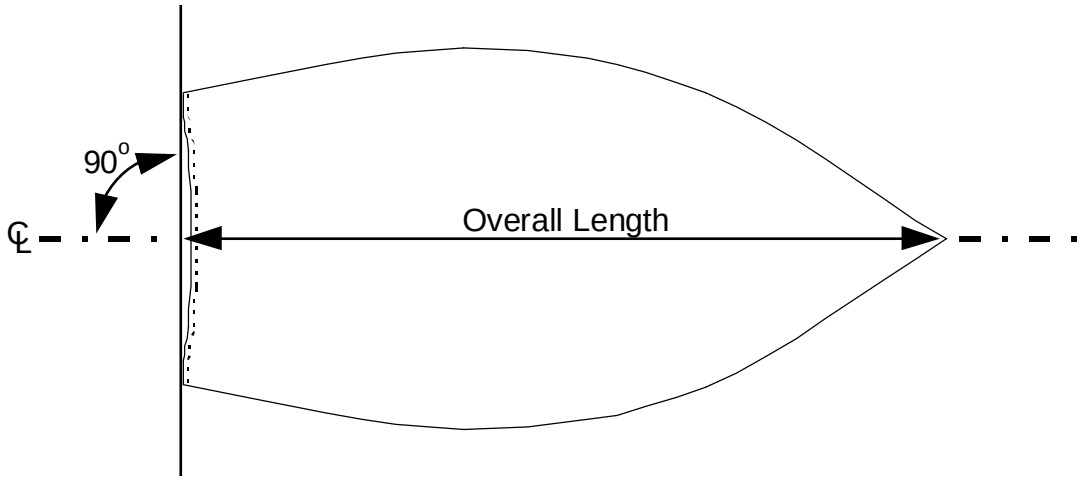
Set the Boat with the waterline horizontal (using the water tube method) and hold a long spirit level against the extreme aft edge of the hull shell / Transom and Stem to establish verticals. Check that the extreme aft edge of the hull / Transom is square, and if necessary use a straight edge to bridge any warping or cut-away sections. Set up a vertical straight edge on the centreline touching the most protuberant extension of the extreme aft edge of the hull or Transom surface, excluding any fittings as detailed in Rule 4.1 (see diagrams). Measure the length parallel to the waterline and fore and aft axis above and below the Hull between the extreme aft edge of hull shell / Transom straight edge and a vertical extension of the most forward part of the Stem. Check these measurement are the same and deduce the actual overall length and Midlength distance from the extreme aft edge of hull shell / Transom vertical. Mark this position on the inside and outside Hull surfaces.

2. Diagrams

2.1 Waterline horizontal



2.2 Straight edge bridging Transom hollows



Measuring Equipment: Long tape measure, Long spirit level, Water tube, levelling equipment (e.g. Car jack & launching trolley), Straight edge longer than Transom width, 2ft straight edge, Waterproof tape or crayon, buoyancy test weights.

BEAM

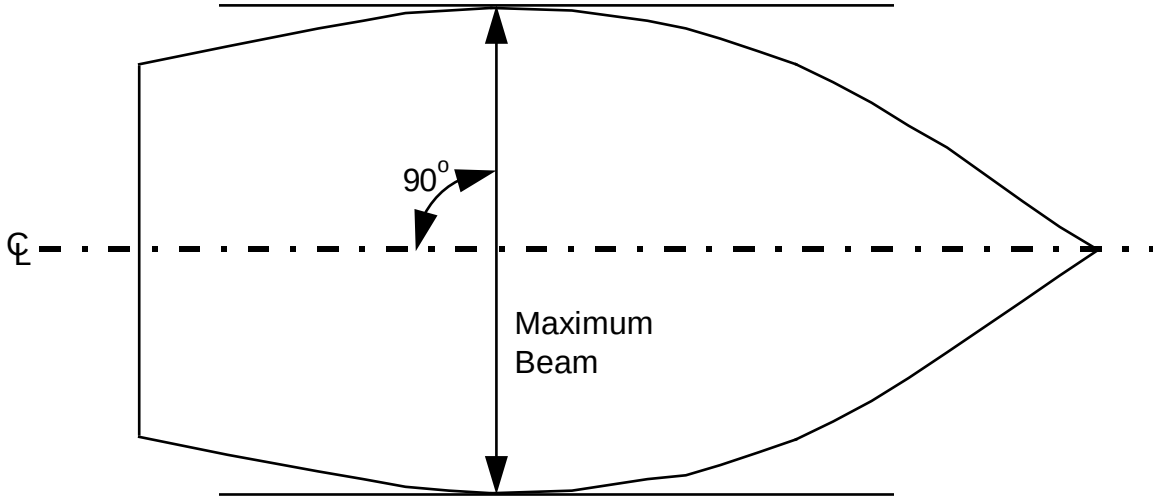
Rule: 4.3.2

1. Measuring the beam

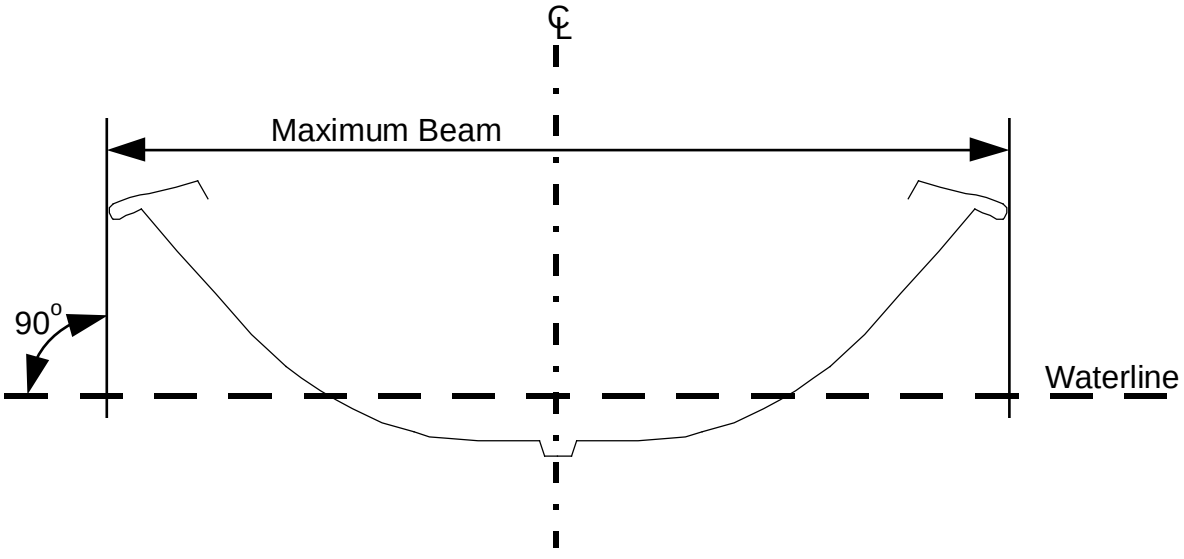
Measure the beam between verticals at widest part of Boat (usually Gunwales).

2. Diagrams

2.1 Plan



2.2 Transverse Section at Widest Point



Measuring Equipment: Tape measure, spirit level, 2 straight edges.

SHEERLINE

Rule: 4.2

1. Sheerline measurement

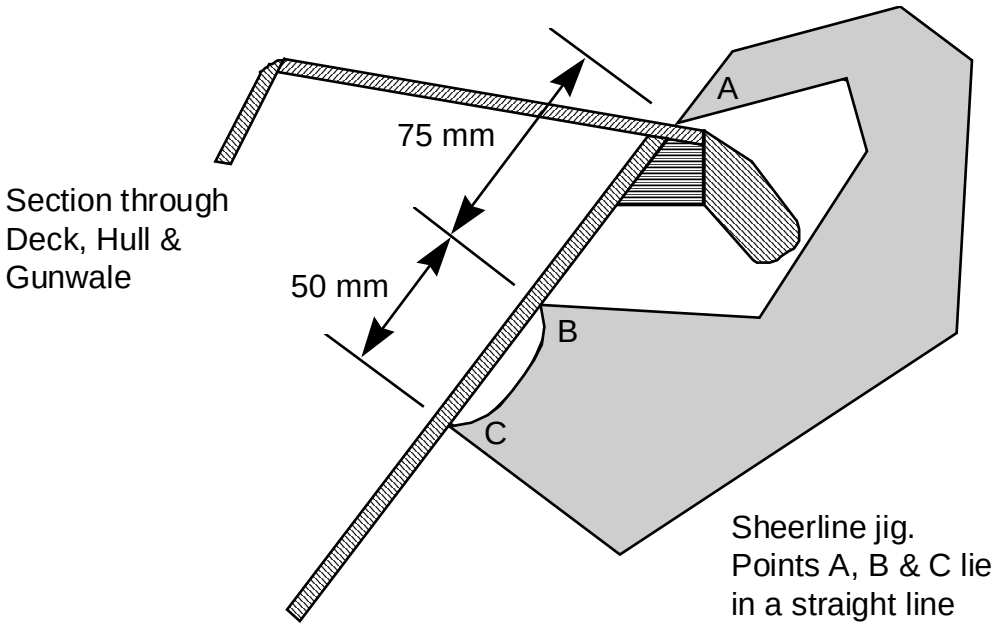
Mark the Sheerline at key positions on both sides of the Boat using the Sheerline jig drawn below. Position the jig on the Deck as shown and mark the intersection point (e.g. with pencil on masking tape). Repeat this process along each side from Bow to Stern with marks approximately every 500mm. Include marks at Midlength and opposite the Mast.

Set hull level across transom and fore and aft. Check that the sheer is concave (i.e. that the Sheerline at Bow and Stern is above the Sheerline in between). Check that the Sheerline is a fair continuous concave curve when viewed from the side(i.e. there are no abrupt changes of height). Use methods shown in diagram 2.2 or 2.3.

Note: If the sheerline jig does not locate an intersection between the upper surface of the Deck or Gunwale and the projection of the outer surface of the skin, Rule 4.2 alternatively defines the Sheerline as 'the highest point on the surface of the Hull within 25mm (measured horizontally inboard) of the widest point of the hull skin at that section'.

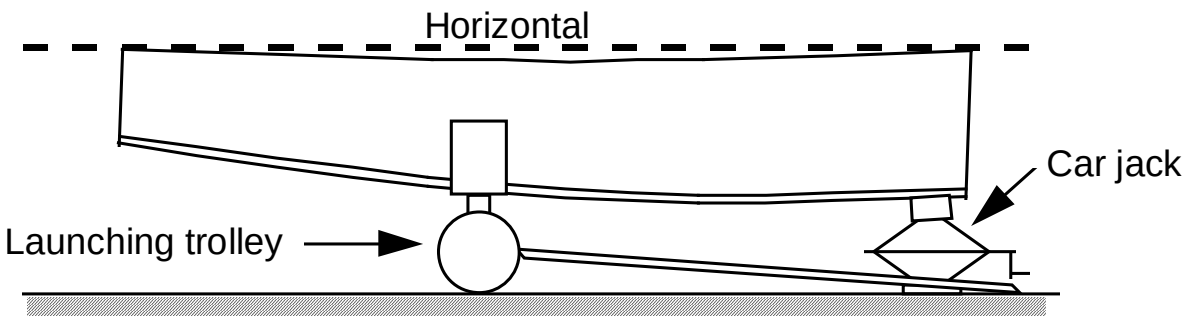
2. Diagrams

2.1 Sheerline jig



Construct jig from rigid material (e.g. 6mm perspex). Hold in a vertical plane with points B and C against side of Hull and point A resting on top surface of Deck.

2.2 Sheerline Measurement - Water tube method



With a helper, set Sheerline points at Bow and both sides at the Stern level by sighting against water level in a tube held against them. Holding level in tube steady against Sheerline point at one end of Boat, move tube along each side of Boat to Sheerline marks on Deck. Check that all marks between Bow and Stern are below water level (i.e. below horizontal).

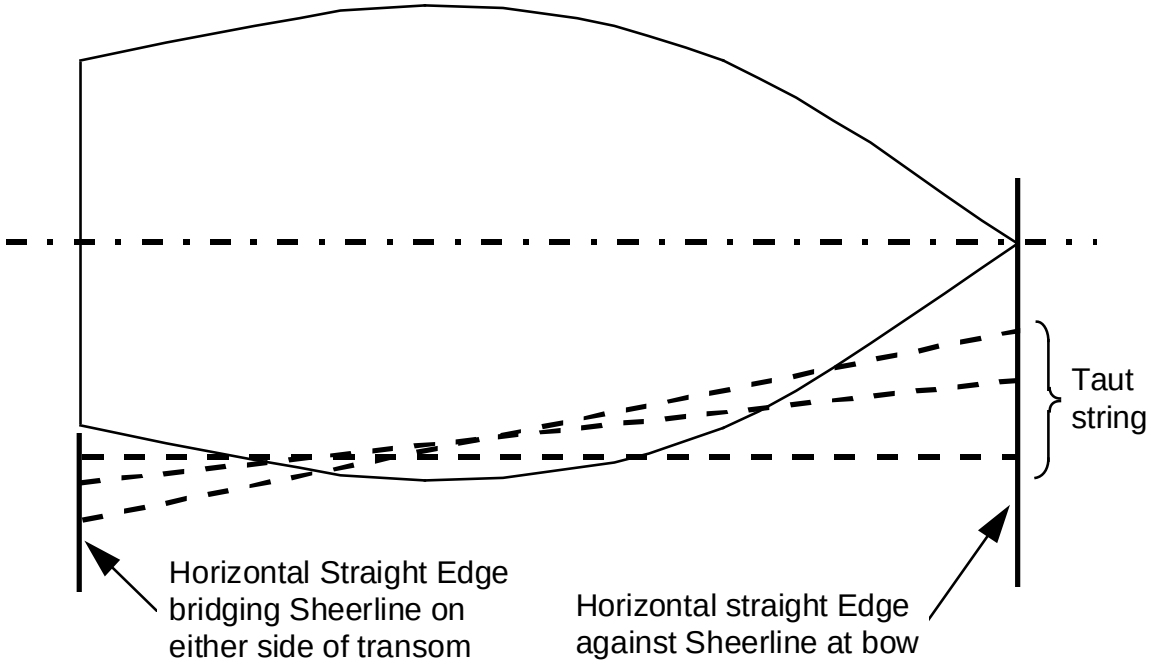
Note:

Water tube diameter should ideally be 15mm or greater to avoid surface tension distortion - the best tube has perspex or glass end pieces connected by clear plastic tubing of smaller diameter. A smaller diameter can be used effectively if care is taken to ensure it is clean and that readings are taken to the bottom of the meniscus.

Fill the tube by siphoning from a bucket to avoid introducing air bubbles. Before use, and at regular intervals, check that when brought together the two ends are at the same level i.e. there is no trapped air affecting the reading.

Take care to ensure that the readings are not affected by stray feet! Keep a thumb over the ends of the tube when moving around the Boat but allow level to re-settle at Bow or Stern sheerpoint after each movement.

2.3 Sheerline Measurement - Taut string method



Set Boat up rigidly with a straight edge clamped against Sheerline points on either side of Transom and set horizontal. Set a second straight edge horizontal and level with Sheerline at the Bow. Fix the string to the Transom straight edge and pull taut over the Bow straight edge. Move the string from side to side and check that it does not touch the Deck when over any of the marked Sheerline points. Move the fixed end along its straight edge to enable all points to be checked. Repeat for other side of Boat.

<u>Measuring Equipment:</u>	Sheerline jig, masking tape, pencil.
Method 2.2	5m water tube at least 15mm diameter, car jack, launching trolley (or equivalent), water, towel!
Method 2.3	Two straight edges at least 2.5m long, long spirit level, thin string (e.g. whipping twine), clamps.

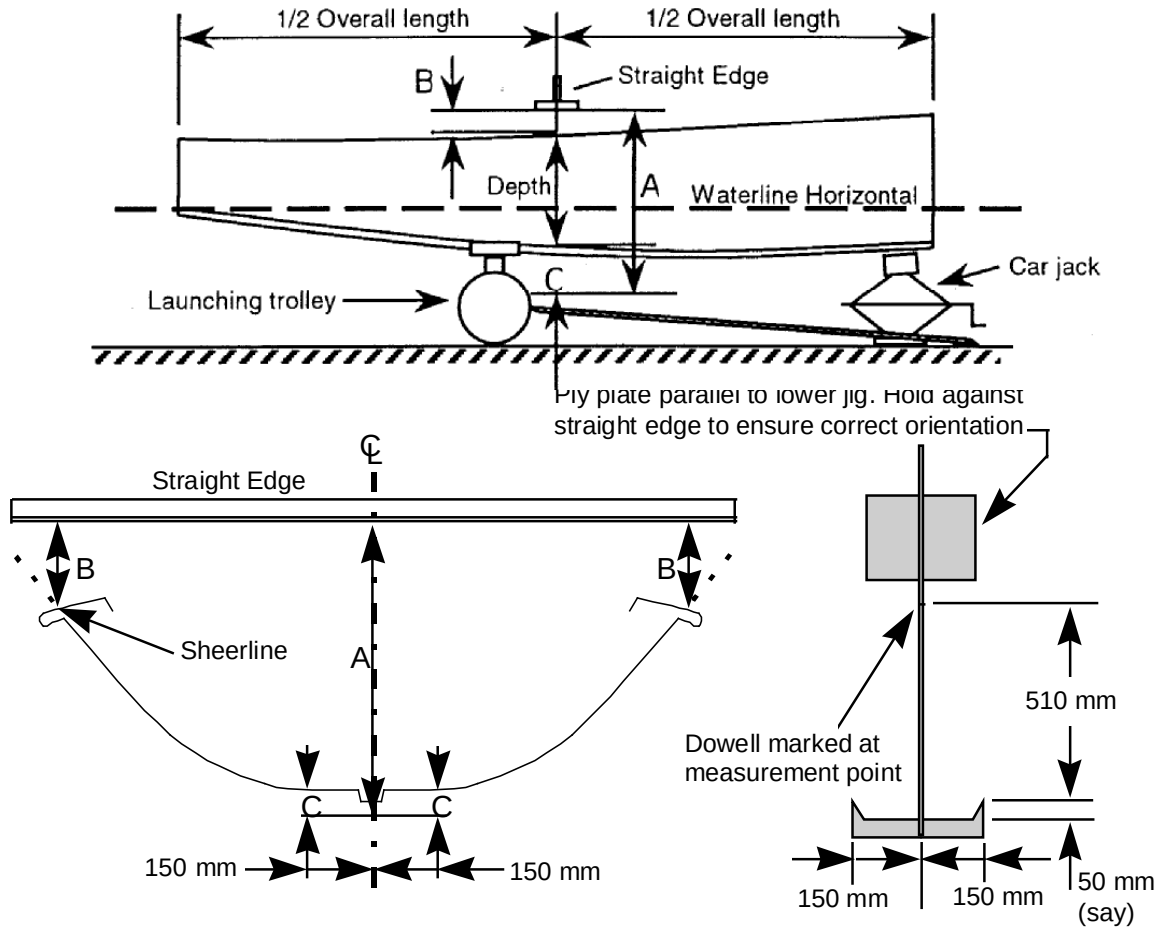
DEPTH AT MIDLENGTH

Rule: 4.4.1

1. Measurement of depth at Midlength

Set straight edge across Decks at Midlength. Adjust Boat so that the straight edge and the water line are both horizontal.
Either: Measure vertically down through the c/b case using plumb bob from the straight edge to a datum point below the hull. Subtract the average distance between the straight edge and the Sheerline points at Midlength and the distance between the datum point and the measurement points defined by the rule and ensure the result exceeds the minimum depth required by the rule.
Or: Use a jig held vertical by use of a level; if the boat is not symmetric deduct the clearance from the initial value to obtain the required measurement.

2. Diagram



At Midlength A minus (B + C) must be greater than 510mm.

Measuring Equipment: Sheerline jig, masking tape, pencil, 2.5m straight edge, plumb bob, short measuring tape, short rule, long spirit level, levelling equipment (e.g. car jack & launching trolley), Optional: Depth Jig.

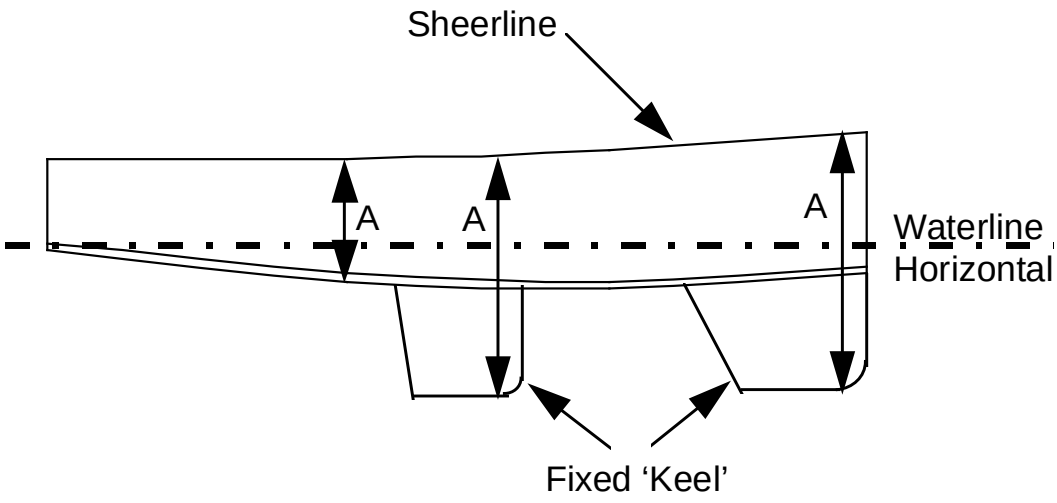
DEPTH AT ANY TRANSVERSE SECTION

Rule: 4.4.2

1. Measurement of maximum depth

Check maximum depth of Hull vertically between Sheerline and bottom of the hull, including any ‘keel’ or ‘keelband’ (with Centreboard housed).

2. Diagram



'A' less than 800mm at all points.

Measuring Equipment: Tape measure, straight edges, Sheerline jig, spirit level, plumb bob.

BEAM - GUNWALE/RUBBING BAND OVERHANG and TUMBLEHOME

Rule: 4.3.1

1. Measurement of Gunwale/rubbing band overhang

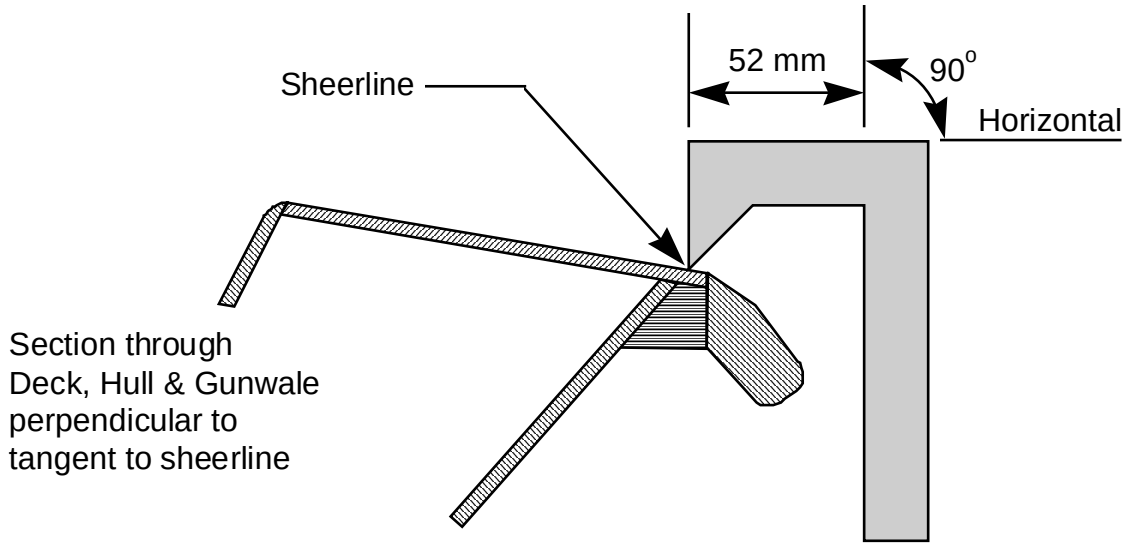
Set Boat up with sheerpoints at transom horizontal and measure Gunwale overhang with Gunwale/Deck jig along complete length of each side, measuring perpendicular to tangent to Sheerline.

2. Measurement of tumblehome

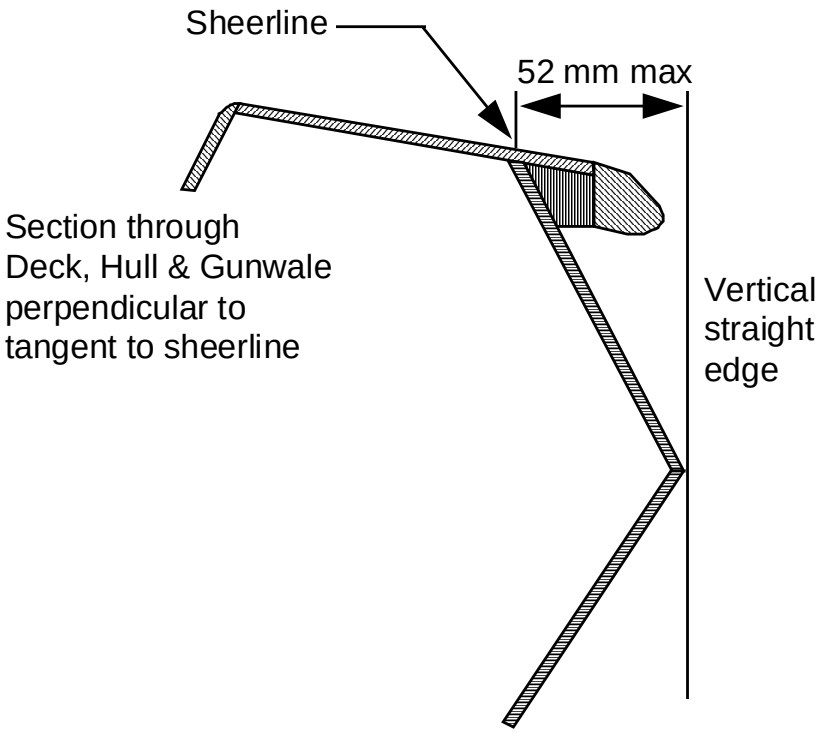
Check topsides for 'tumblehome'. Use vertical straight edge to measure offset of any tumblehome found.

3. Diagrams

3.1 Gunwale/rubbing band overhang



3.2 Tumblehome



Measuring Equipment: Sheerline jig, masking tape, pencil, Gunwale Width jig or adjustable square with levelling bubble, small spirit level, 0.75m straight edge, 150mm rule.

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TRANSOM CLOSING DEVICES

Rule: 4.11

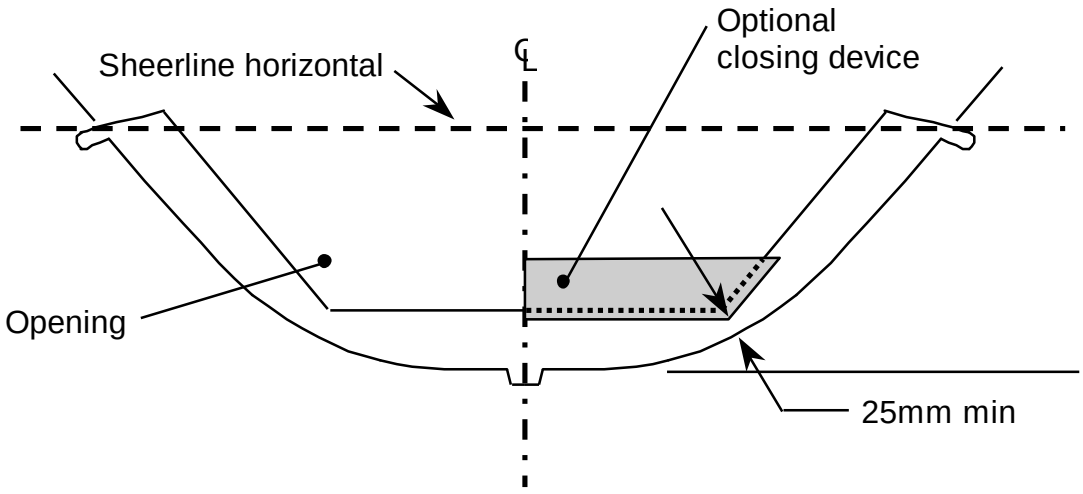
1. Measurement of Transom closing devices

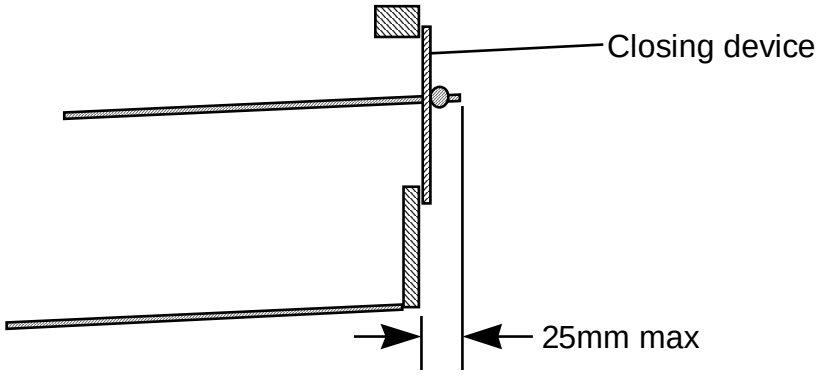
Measure distance between any closing devices fitted to ensure they are not within 25mm of the skin.

Check that any closing devise cannot act to extend the effective length of the boat.

Check to ensure that no closing devise, when closed, extends more than 25mm aft beyond the measured length of the hull.

2. Diagrams





Measuring Equipment: 2.5m long straight edge, spirit level, clamps, short measuring tape.

NUMBER

Rule: 3.1

1. Identification Marks

Check that the correct registered number is carved or cut into the thwart or top of the Centreboard case with legible numbers greater than 25mm high and sufficiently deep to be permanent after re-varnishing etc.

Measuring Equipment: 150mm rule.

BUOYANCY - SECURITY, MINIMUM NUMBER, SIZE & RIGID FOAM

Rules: 6.1, 6.2

1. Text

Check fastenings under Rule 6.1. Security of straps and covers may be tested by a sharp pull. Fastenings must be protected from chafe. Bags must not be secured by their loops alone and must be restricted from movement in all directions.

With any one air filled unit free to flood at least 40kg of positive buoyancy must remain within other intact units and the hull. Where two or more units are fitted, when any two units are free to flood, at least 20kg of positive buoyancy must remain within other intact units and the hull.
Note: 20kg buoyancy is equivalent to a volume of $0.02m^3$ (e.g. 275mm x 275mm x 275mm).

If Hull is constructed from plastic or metal, check volume of foam incorporated into the construction under Rule 6.2. If foam sandwich construction is used for skin, measure volume by multiplying average girth measurement by Hull length and thickness. Check disposition by re-calculating either side of Midlength. Multiply volume by density of water ($1000kg/m^3$) to obtain displacement.

Measuring Equipment: Tape measure, calculator.

RISE OF FLOOR

Rules: 4.3.3

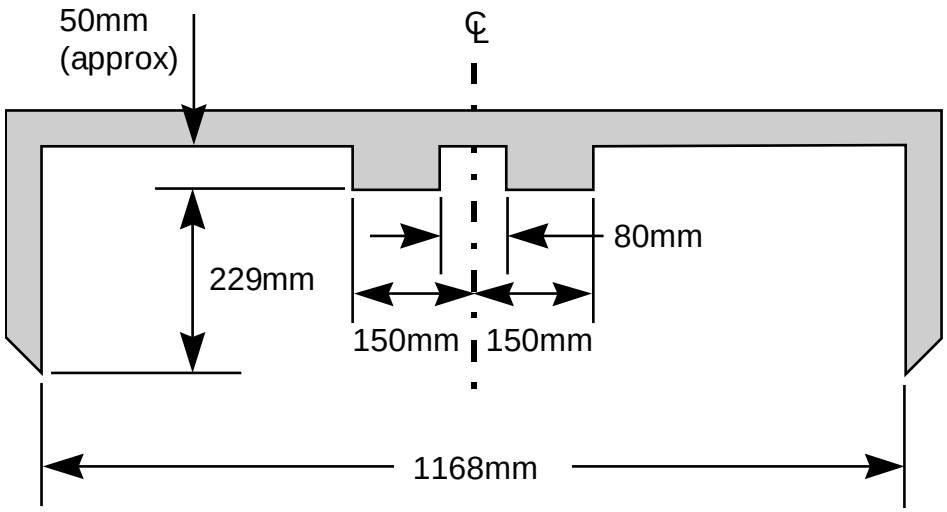
1. Measurement of Rise of Floor - Rule 4.3.3

Rise of floor is measured with the Boat upside down with the waterline horizontal and jig held vertical and positioned exactly at Midlength and set square to the fore and aft centreline. The Midlength position should be marked on the outside of the Hull, adjacent to the keel, during the length check with the Boat upside down. With the jig position as described above, the central areas should clear the Hull while the outer points rest on it (or on a 'rigid' girth band bridging the planks of clinker boats). The central areas must also clear a bridge laid fore and aft across any hollows in the skin at Midlength. Mark the points where the outer points touch the skin with tape and pencil.

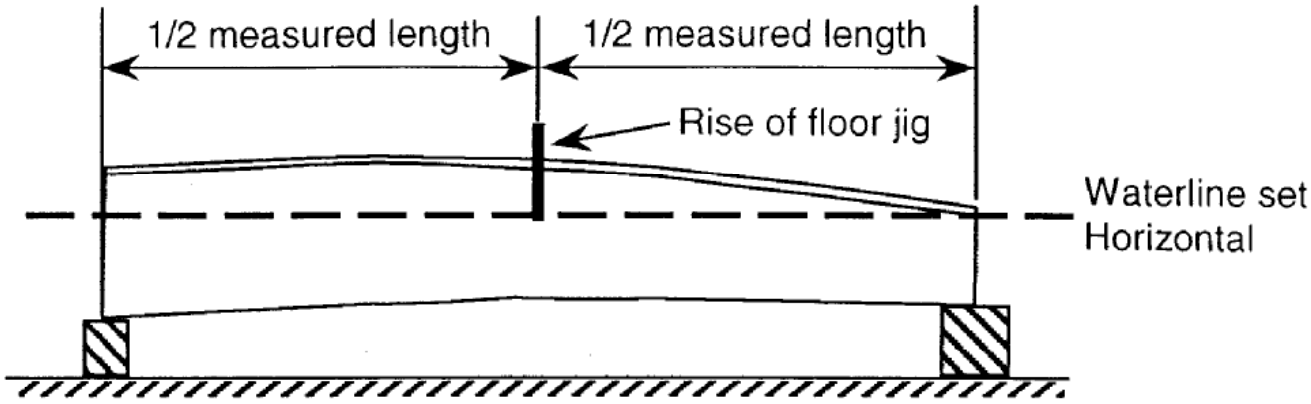
2. Diagrams

2.1 Rise of Floor Jig

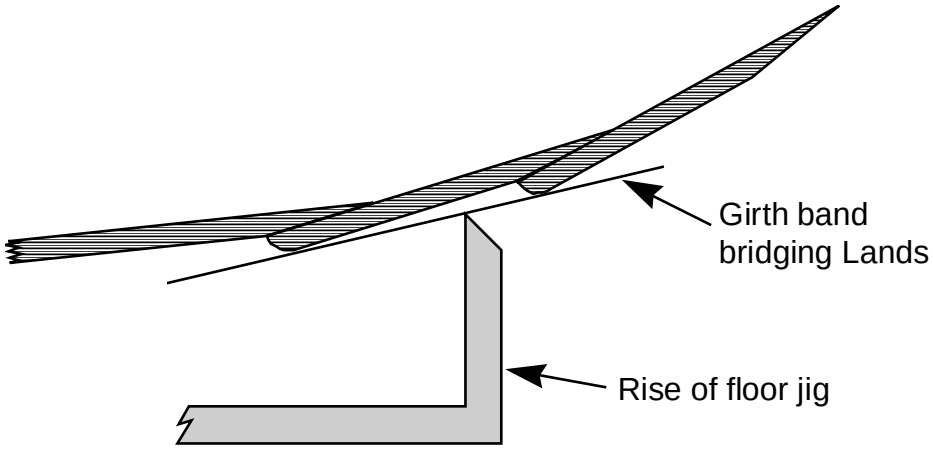
The jig should be made of a rigid material (e.g. Aluminium). It should be robust to avoid any twisting/distortion. Wooden jigs should have hard insets at the measurement points. The final dimensions should be obtained by 'trimming' with a fine file. It is advisable to check the jig dimensions before use.



2.2 Measurement Method



2.3 Clinker Hulls



Measuring Equipment: Rise of floor jig, masking tape, pencil, tape measure, spirit level.

TOPSIDES - HOLLOWS

Rule: 5.2

1. Measurement of hollows - Rule 5.2

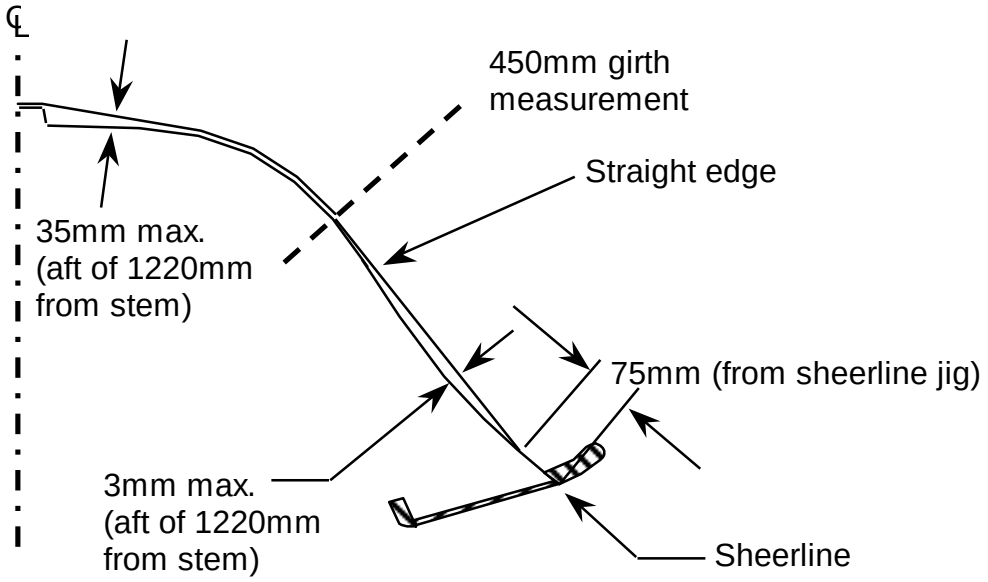
Check for hollows in any transverse section aft of 1220mm from the Stem. Transverse section is defined in YR6. Use a 0.75m (approx.) straight edge and measure any hollows with a 150mm rule held square at deepest point. Sheerline jig shows position for 75mm below Sheerline.

Within 450 mm girth measurement of the centreline of the hull hollows must be less than 35mm.

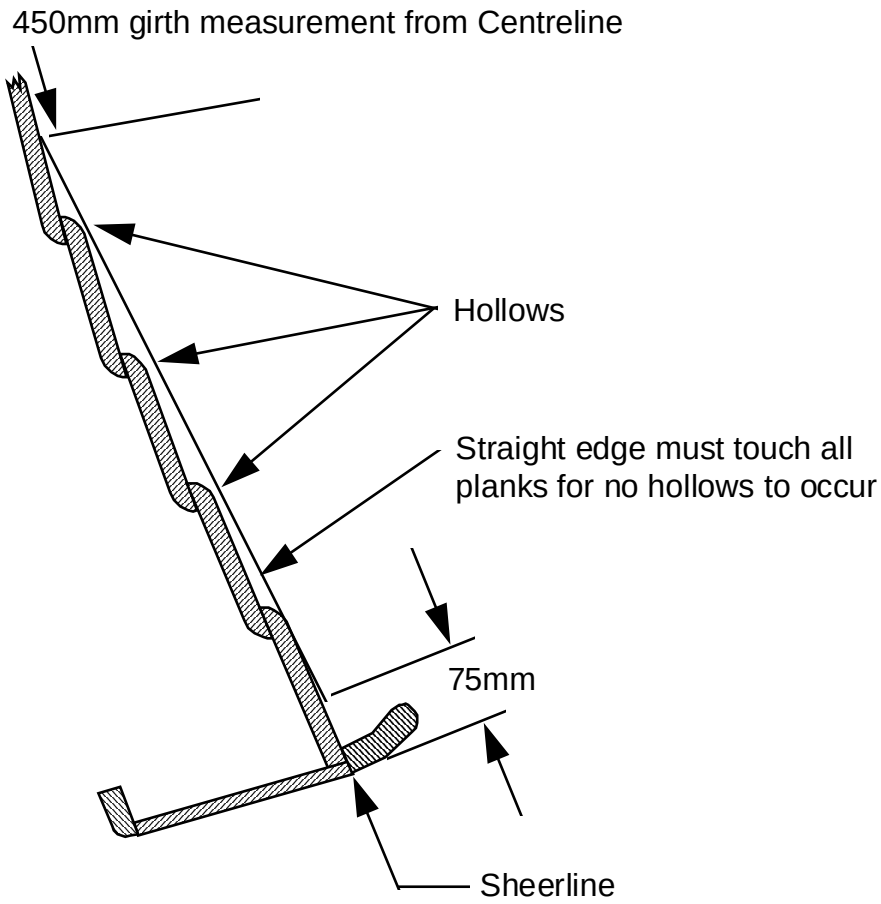
Beyond 450 mm girth measurement of the centreline of the hull hollows must be less than 3mm.

2. Diagrams

2.1 Hollows - Non-clinker boats



2.2 Hollows - Clinker boats



Measuring Equipment: 0.75m straight edge, 150mm rule, tape measure, Sheerline jig/masking tape/pencil, (thin string).

POSITION OF SHEERLINE (AND LOWER BAND) ON MAST

Rules: 11.3.1, 11.5.1

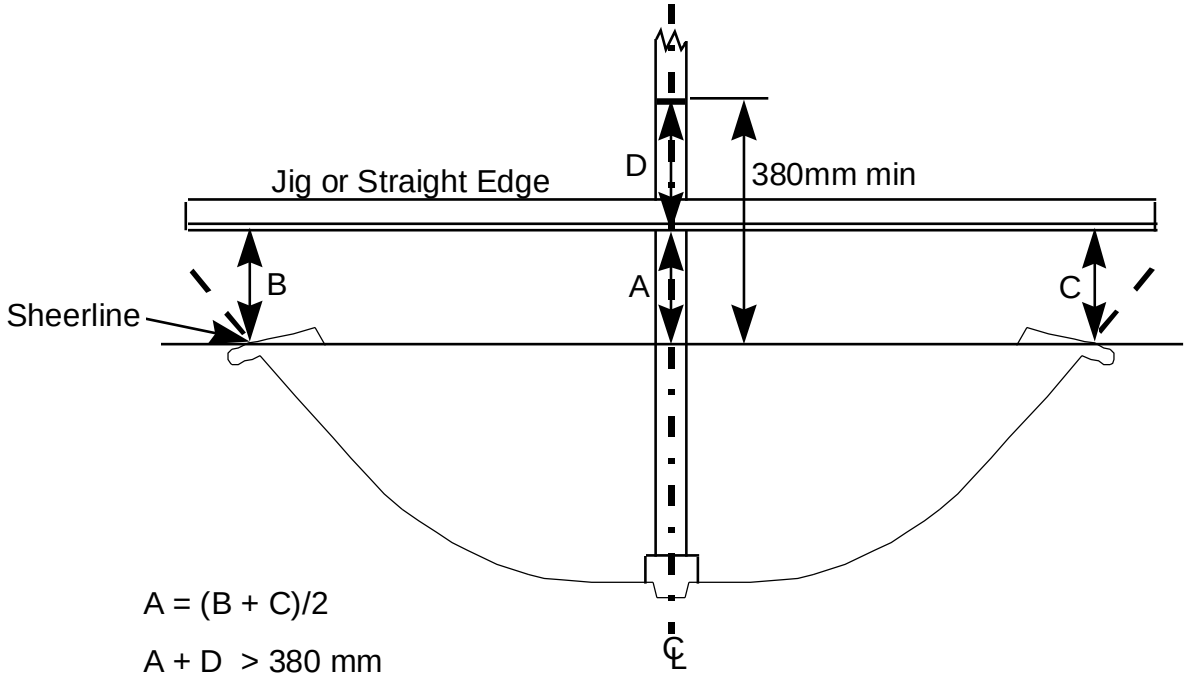
1. Locate Sheerline height on Mast

Set Boat level with Mast erected in normal sailing position. Mark Sheerline on Decks either side of Mast. Set jig or 2.5m straight edge square across the Boat resting on the aft side of the Mast. Measure distance between underside of straight edge and each Sheerline mark on the Deck using a short rule. Determine the average distance and measure this distance below the straight edge and mark position permanently on the Mast. If the mast is deck-stepped it may be necessary to mark at an offset of say 100mm above the Sheerline - remembering to deduct the offset from other measurements!

2. Check position of Lower Coloured Band

Measure up from Sheerline position on Mast and ensure that upper edge of Lower Coloured Band is more than 380mm above the Sheerline. If the band is not of paint, ensure that the measurement point is inscribed into the mast surface.

3. Diagram



Measuring Equipment: Sheerline jig, masking tape, pencil, 2.5m straight edge or straight edge jig with moveable legs, 150 or 300mm rule, tape measure, scriber, thin indelible felt pen.

STABILITY OF MAST

Rules: 9.4

1. Stability of Mast/Lowering of Sails - Rule 9.4

Check that halyards or other sail hoisting devices are secured so that the crew can release them from within the Boat (i.e. with feet on inside of Hull shell) and thus lower the sails. With both sails lowered, check that the Mast is secured in the Boat (e.g. with a pin through the Mast heel or some other fitting), even if the rigging is slack.

Measuring Equipment: None.

JIB TACK POSITION and JIBSTICK OPERATION

Rules: 11.4.5, 11.6

1. Jib Tack position (Rule 11.4.5)

Check that the jib tack will remain in an approximately fixed position (throughout).

1. Measurement of Jibstick operation (Rule 11.6)

Check that when the Jibstick is in position for booming out the jib, it is attached to the Mast.

Measuring Equipment: None.

CENTREBOARD - PROTRUSION, HOUSING & OPERATION

Rule: 7

1. Centreboard projection - Rule 7.1

With the Boat on its side check that the Centreboard cannot protrude more than 1070mm below the Hull (including any ‘keel’ and/or ‘keelband’).

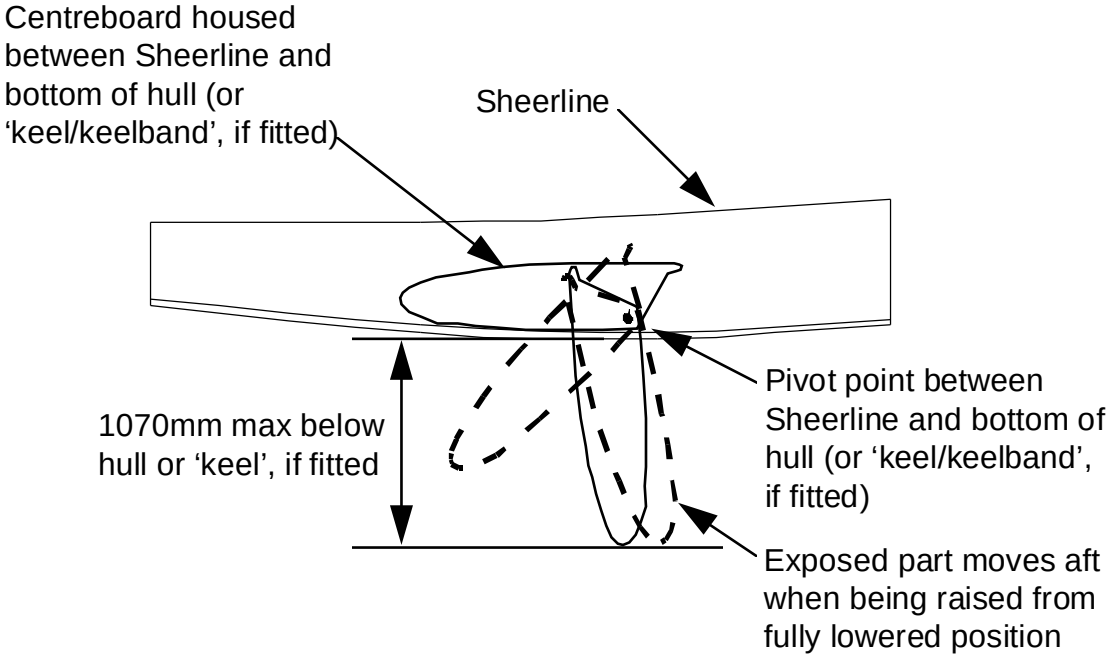
2. Centreboard operation - Rules 7.2, 7.3 and 7.4

Check that there is a single pivot point fixed relative to Centreboard and Hull and that it rotates into a fully raised position where it does not protrude below the Hull(including any ‘keel’ and/or ‘keelband’) or above the Sheerline. When the Centreboard is being raised the part below the Hull should not move forward relative to the Hull.

3. Water displacement from Centreboard case - Rule 7.5

Check that the Centreboard case contains no devices to exclude water from the space occupied by the Centreboard when fully raised. Check that the maximum thickness of the 'slot gaskets' is no more than 3mm.

4. Diagram



Measuring Equipment: Tape measure, 150mm rule, 2.5m straight edge, Sheerline jig, masking tape & pencil.

MAST MEASUREMENTS

Rules: 8.1.2, 10.2, 10.1, 11.5.1

1. Centre of Gravity above Sheerline - Rule 8.1.2

Check that the Mast centre of gravity mark (see page 4) is not less than 2285mm above the Sheerline mark (see page 25).

2. Fore Triangle Height - Rule 10.2

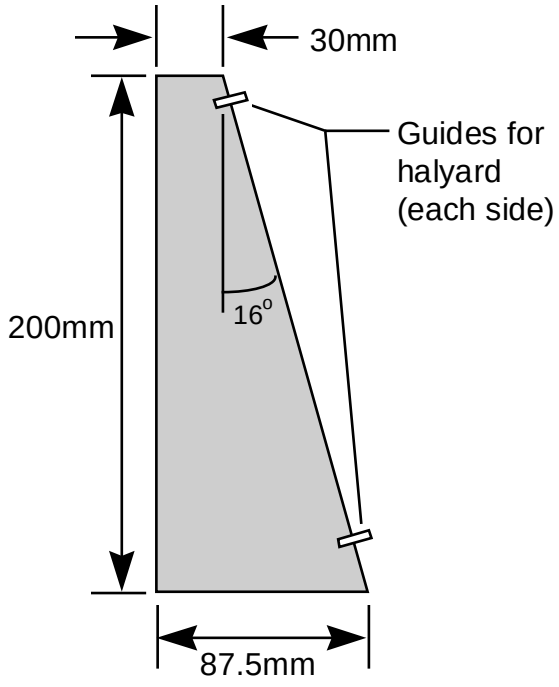
Check that the distance from the Sheerline to the point where the extension of the luff of the jib intersects the Mast when held at a downward slope of 2:7 (16°) does not exceed 4575mm.

3. Upper band height - Rule 10.1

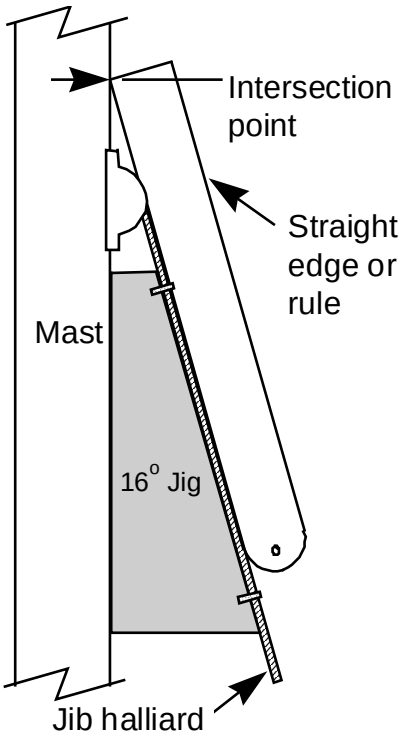
Check that the distance from the Sheerline mark to the lower edge of the upper coloured band is not more than 6100mm. When hoisted and secured the highest point of the mainsail must fall below the lower edge of the upper band. If the band is not of paint, ensure that the measurement point is inscribed into the mast surface.

4. Diagrams

4.1 Fore triangle angle jig - construct of hardwood/perspex or similar material.

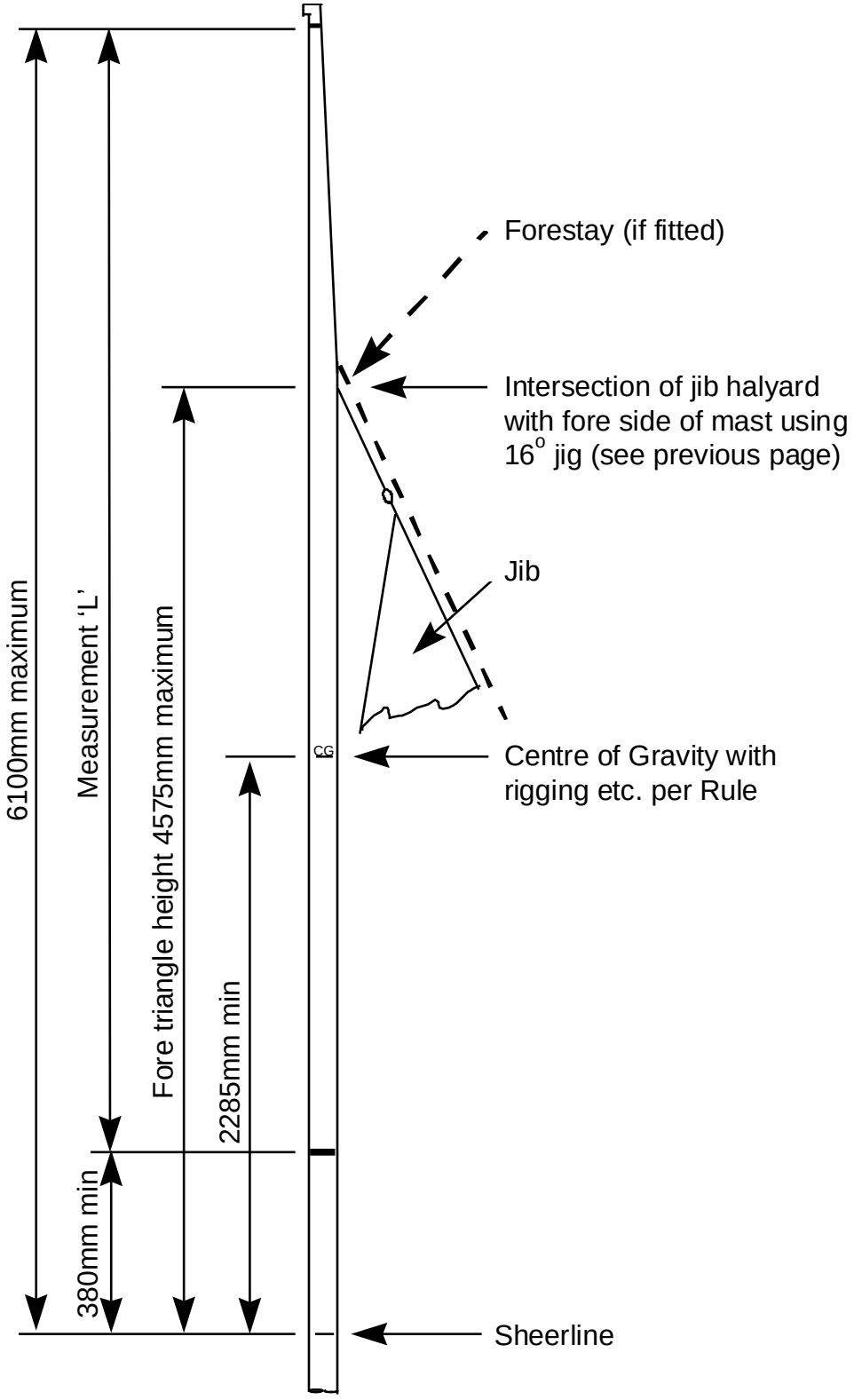


16° JIG FROM HARDWOOD OR PERSPEX



USE OF 16° JIG

4.2 Mast Measurements



Measuring Equipment: Tape measure, fore triangle angle jig, straight edge (150mm rule), sheerline jig, scriber.

MAINSAIL LUFF AND FOOT (SPAR) MEASUREMENT AND ATTACHMENT POINTS

Rules: 11.3.1, 11.3.3, 11.2

1. Measurement of Mainsail Luff - Rule 11.3.1

With the Boat on its side and Mast stepped and straight determine the mainsail luff measurement 'L' as the distance between the lower edge of the upper coloured band and the upper edge of the lower coloured band. If the bands are not of paint, ensure that the measurement points are inscribed into the mast surface.

2. Measurement of Mainsail Foot - Rule 11.3.3

Fit the Boom to the gooseneck and hold parallel to the fore and aft centreline and square to the Mast. Measure the distance 'F' from the extension of the aft side of the sail track (see diagrams) to the inner edge of the Boom coloured band. If the band is not of paint, ensure that the measurement point is inscribed into the boom surface. Masts with a cut-away (e.g. Needlespars) can be measured by holding a spare piece of the same track against the rear face of the Mast above the gooseneck. The offset on Masts with a flared sail entry groove must be measured with a straight edge and added to the direct distance to the back edge of the Mast above the gooseneck.

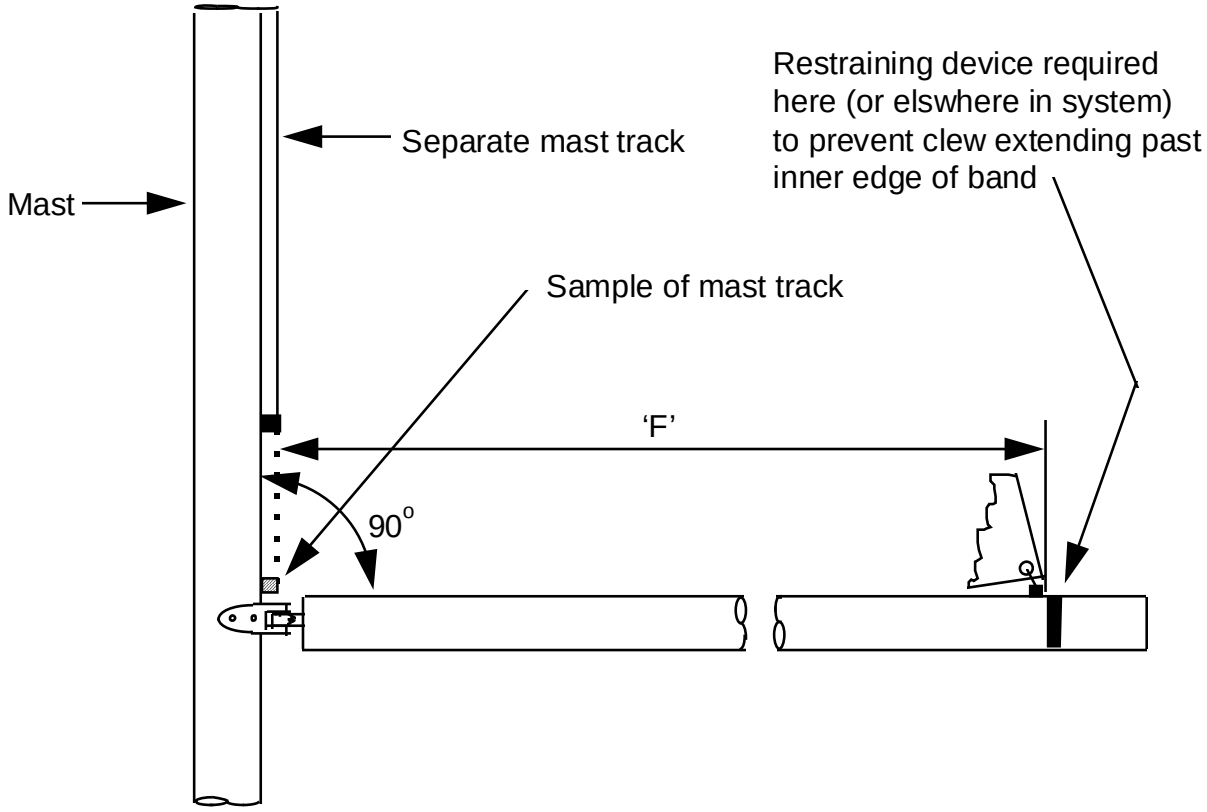
Note that the actual measured 'F' should be greater than the minimum 'F' allowed by the mainsail cross widths but less than or equal to the distance 'F' quoted on the Certificate/Measurement form and used for the sail area calculations. The band should also be beyond the point which the sail can reach when rigged normally.

3. Attachment Points - Rule 11.3.1

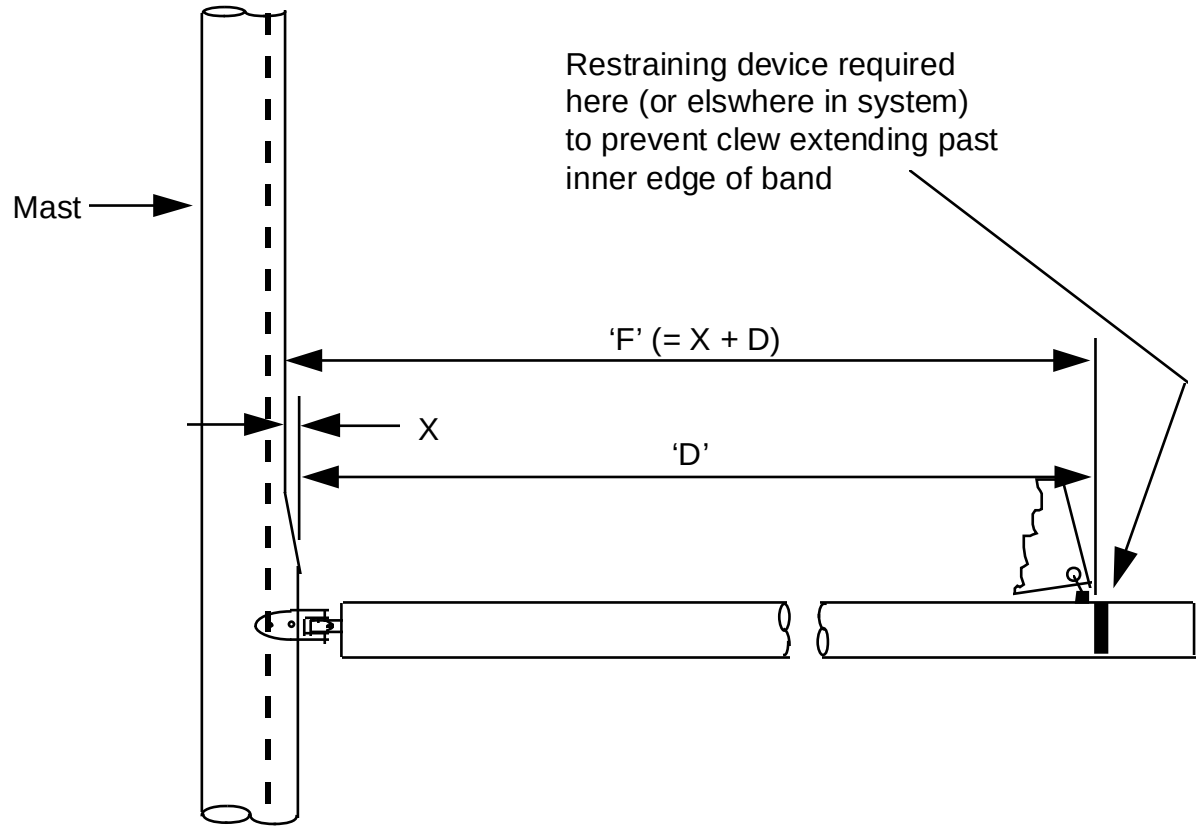
Inspect the fittings for securing the mainsail tack and clew to the spars. If necessary hoist the sail to its normal position to ensure that no part extends beyond the coloured bands. Define the tack measurement position and, unless the attachment point is within the boom or boom fitting and above the centreline of the boom, check that this stays above the band irrespective of the tension on the cunningham and clew eyes (see diagram).

4. Diagrams

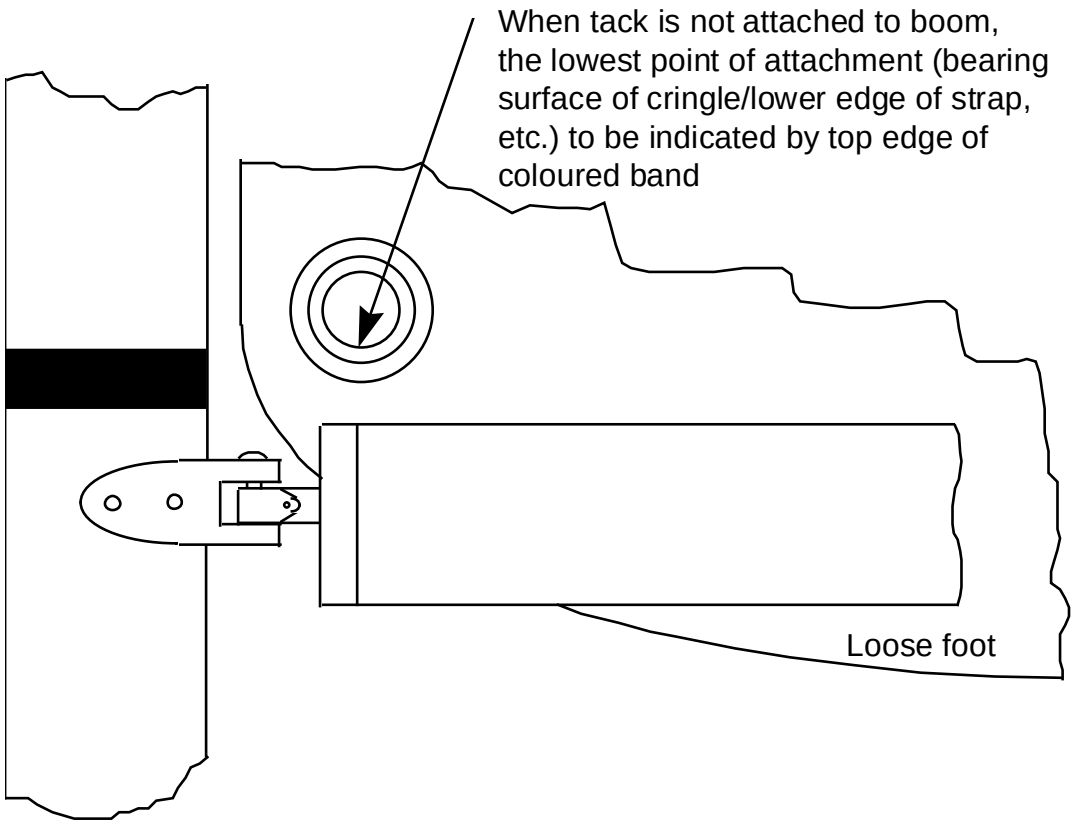
4.1 Mast with 'cut-away' sail track.

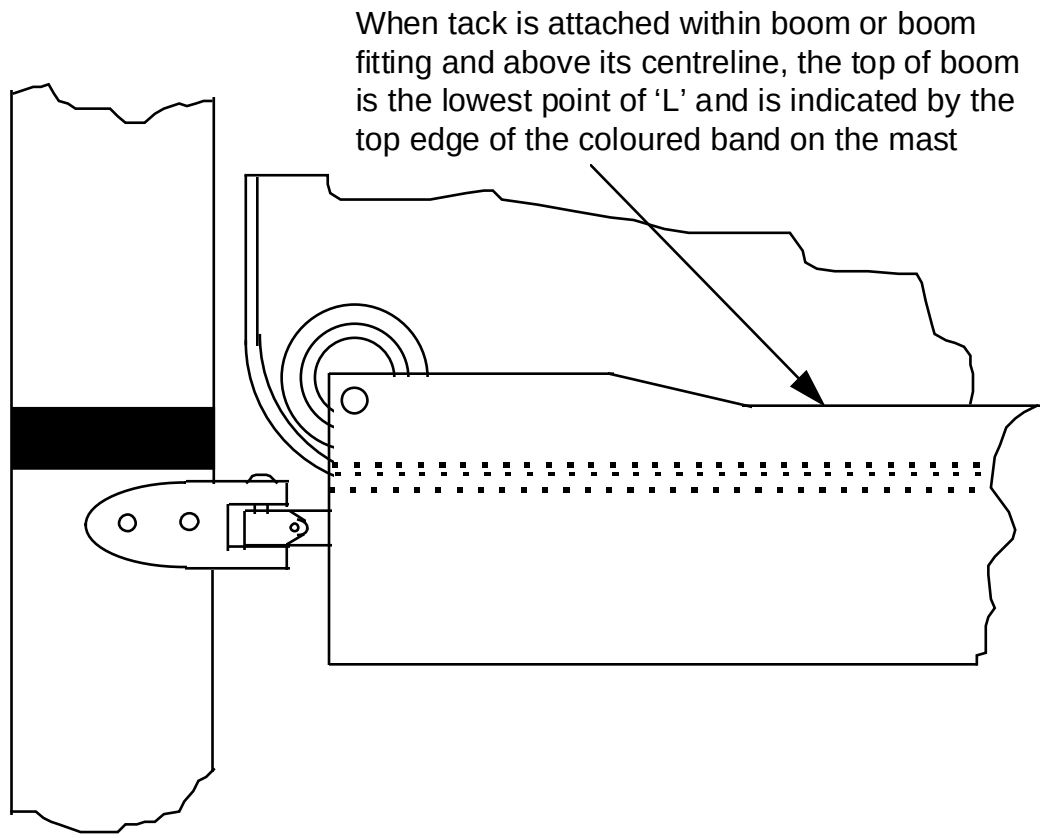


4.2 Mast with 'flared' sail entry.



4.3 Tack Attachment Point





Measuring Equipment: Measuring tape, straight edge, scriber, set square?, callipers (for track extension).

SAIL MEASURING SEQUENCE

Rule: 11

A. Sequence for measuring a new Rig

1. Measure actual Jib Area according to Rule 11.4. Record actual Luff and Diagonal dimensions (see pages 36/37). Check that the jib will be set according to Rule 11.4.5.

2. Measure and record Mainsail Cross Widths according to Rule 11.3.6 (see Page 40). Use tables (Pages 44 to 46) to determine the minimum foot measurement required for the Mainsail (usually controlled by 1/2 or 3/4 point cross-widths.

3. Measure 'F' along the boom according to Rule 11.3.3 (see Page 31) and check that this exceeds the minimum from (2). Note the larger measurement.

4. Advise owner to allow (say) 5mm on Jib Diagonal measurement. Calculate the Jib Area accordingly.

5. Subtract this area from total allowable (Rule 11.1) and record maximum permitted mainsail area.

6. Calculate maximum length 'L' (Rule 11.3.1) from permitted mainsail area and 'F'. Measure actual Mainsail Luff dimension 'L' between bands on Mast and ensure that this is less than the maximum permitted value. Check position of bands in relation to Sheerline and fixing point of Mainsail tack (see Pages 25, 30, 31, 32 and 33). If mast is new, check weight, CoG and fore triangle height (Pages 4, 29 and 30). If the coloured bands are not of paint, ensure that the measurement points are inscribed into the spar surface.

7. Check Battens, sail markings, reinforcement etc. according to the remaining provisions of Rule 11 and relevant ISAF prescriptions (see Page 40).

8. Mark and record sail measurements according to Rule 11.5. Note that actual cross widths are recorded on Mainsail but maximum permitted cross widths are recorded on Certificate/Measurement Form. The calculated Jib area, including allowance for stretch is marked on the Jib and the permitted jib area is marked on the boom (Rule 11.5.3). Sails first measured after 1/3/93 should have an area of woven material to receive the measurers markings according to Rule 11.5.6.

B. Sequence for Measuring an Existing Rig

See overleaf.

B. Sequence for Measuring an Existing Rig

1. Measure existing Mainsail Luff and Foot dimensions from Mast and Boom bands and check against those recorded on Certificate.

2 Measure Jib Luff and Diagonal and record dimensions according to Rule 11.4. Calculate area, with some allowance on 'D' for stretch (see pages 36/37 or 38/39). Compare with maximum permitted per Certificate and Boom. Check that the jib will be set according to Rule 11.4.5.

3. Measure and record Mainsail cross widths. Check that they are all within the maximum permitted (should be shown on Certificate). Mark actual widths on sail.

4. If measurements from 1, 2 or 3 exceed the original dimensions, treat the rig as new and follow sequence A, above.

5. If new sails fit within original sail plan mark Jib Area (including stretch allowance) on Jib.

6. Complete remainder of checks as in A7 and A8.

JIB MEASUREMENT AND OTHER CHECKS

Rules: 11.4.1-6, 11.5.2, 11.5.6 & 11.8

1. Measurement of Jib Area - Rules 11.4.1 - 11.4.6

For new jibs, or those to be measured under Rules effective from 1/3/93

All measurements taken are to be rounded up to the nearest mm with the sail dry and lying on a flat surface and just sufficiently tensioned to remove any wrinkles across the line of the measurement being taken (Rule 11.4.1). To ensure that no wrinkles remain, flake the sail either side of the line of the measurement being taken. The definitions of the measurement points are given in the preamble to Rule 11.4.

The Luff measurement 'L' is taken from the highest point of the sail material (on a line normal to the Luff or its projection) to the lowest point of the sail material within 50mm of the Luff or its projection (Rule 11.4.2).

The Diagonal measurement 'D' is taken from the point on the Clew cringle furthest from the nearest part of the Luff to the Luff, bridging any local hollows in the Luff. This is achieved by holding the tape on the Clew measurement point and swinging the tape to find the minimum distance (Rule 11.4.3).

The jib area is found from the formula (L x D)/2,000,000 rounded up to the next $0.001m^2$. The curved areas of the foot and leech are excluded from the measurement (Rule 11.4.4).

Check that the centre of the clew cringle is within 26mm of the nearest edge of the sail, bridging any hollows with a straight line (Rule 11.4.6).

2. Check stiffening - Rule 11.8

Check that the body of the sail is flexible, and capable of being folded flat, without permanent damage. Reinforcement is permitted within 320mm of the corners (or Cunningham or reefing eyes. Check that any reinforcement in the tack area has a total height of less than 150mm (including any fittings and eyes). Check that reinforcement can be folded with an outside diameter of 15mm without damage. Check that any tabling which cannot be folded flat is of no more than 40mm maximum width and can be folded with an outside diameter of 15mm. Any other forms of stiffening must be capable of being folded flat without damage.

3. ISAF/RYA Racing Rules of Sailing Requirements - Appendix G3.1(b)

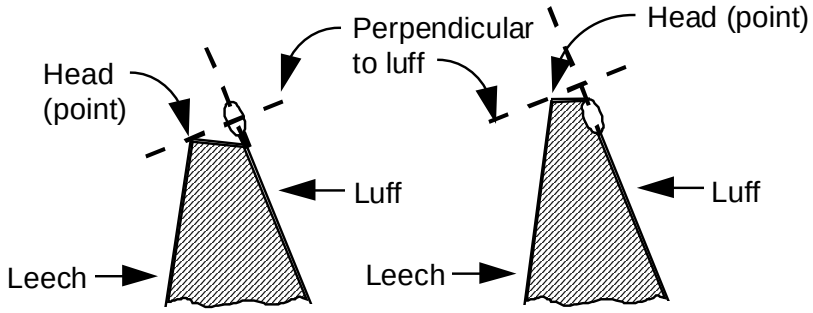
Check that the makers mark is within the larger of 300mm or 15% of the foot length of the tack corner of the sail material.

4. Mark Sail - Rules 11.5.2 & 11.5.6

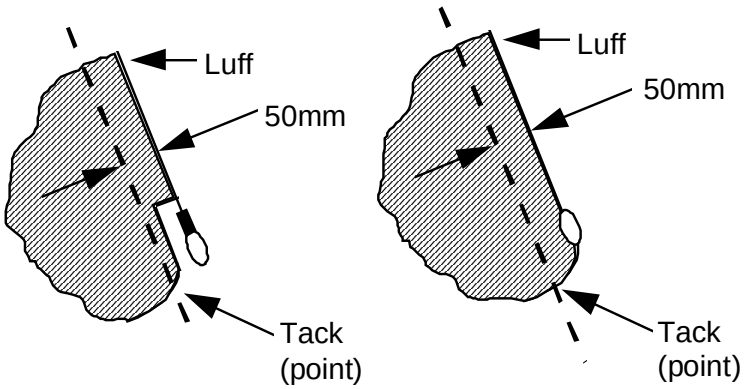
If sail complies with above, mark area computed as above on woven material of required area at tack together with signature and date.

5. Diagram **(for sails first measured after 1/3/93)**

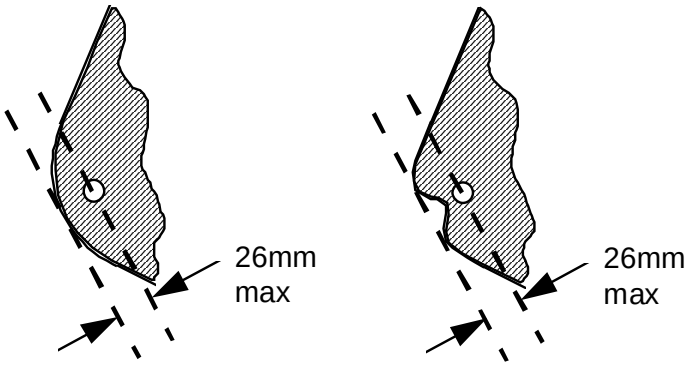
HEAD DEFINITION:

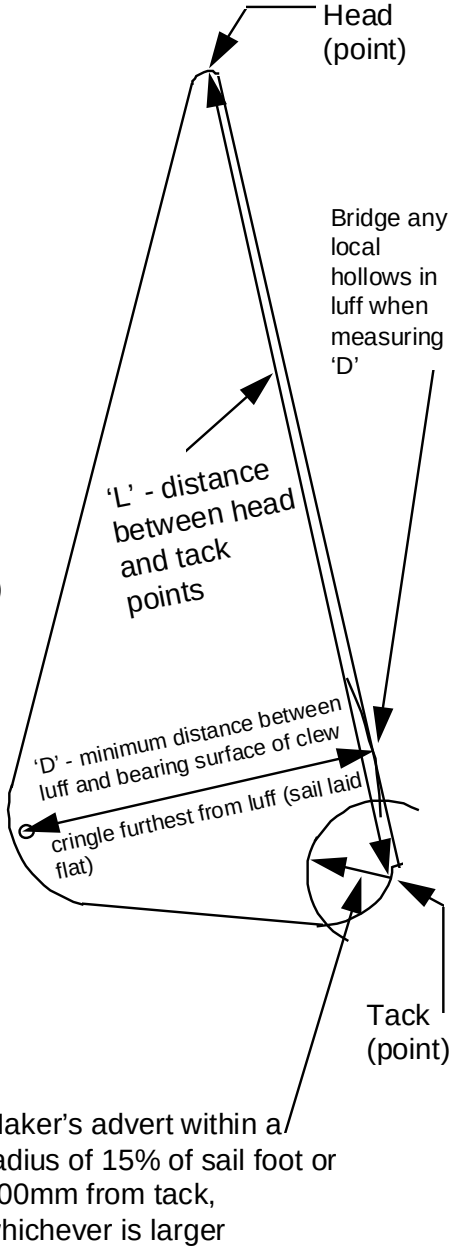


TACK DEFINITION:



CLEW CRINGLE LOCATION:





Note: The measurements are to be taken with the sail laid flat and with just sufficient tension applied to remove any wrinkles across the line of the measurement being taken.

Measuring Equipment: Long & Short measuring tapes, calculator, callipers or gauge set to 15mm, ?straight edge, indelible marker.

JIB MEASUREMENT AND OTHER CHECKS

Rules: 11.4.1-6, 11.5.2, 11.8

1. Check Measurement of Jib Area - Rules 11.4.1 - 11.4.5
For jibs first measured under Rules effective before 1/3/93

All measurements taken are to be rounded up to the nearest mm with the sail set on the Boat with standard rig tension and sheet pulled tight and cleated or otherwise made fast.

The Luff measurement 'L' is taken between the bearing surface of head cringle and tack cringles of the luff wire. If a luff wire is not fitted then the bearing surfaces of the head and tack cringles within the sail are used.

The Diagonal measurement 'D' is taken from the bearing surface of the Clew cringle to the nearest point of the Luff. This is achieved by holding the tape on the Clew measurement point and swinging the tape to find the minimum distance.

The jib area is found from the formula (L x D)/2,000,000 rounded up to the next $0.001m^2$. The curved areas of the foot and leech are excluded from the measurement.

Check that the centres of any cringles within the sail are within 26mm of the nearest corner of the sail.

2. Check stiffening - Rule 11.8

Check that the body of the sail is flexible, and capable of being folded flat, without permanent damage. Reinforcement is permitted within 320mm of the corners (or reefing eyes), check that such reinforcement can be folded with an outside diameter of 15mm without damage. Check that any tabling which cannot be folded flat is of no more than 30mm maximum width and can be folded with an outside diameter of 15mm. Any other forms of stiffening must be capable of being folded flat without damage.

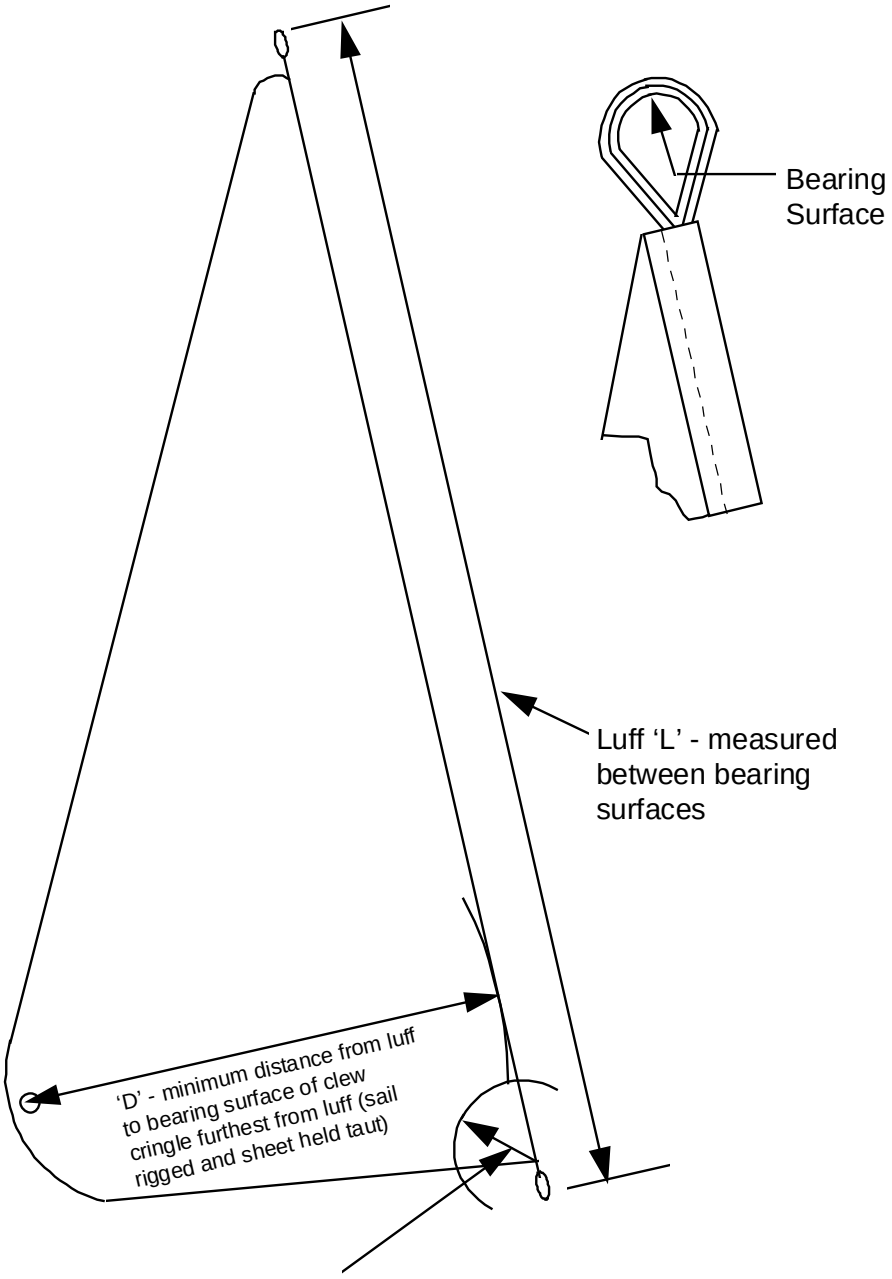
3. ISAF/RYA Racing Rules of Sailing Requirements - Appendix G3.1(b)

Check that the makers mark is within the larger of 300mm or 15% of the foot length of the tack corner of the sail material.

4. Mark Sail - Rule 11.5.2

If sail complies with above, mark area computed as above at tack together with signature and date.

5. Diagram **(for sails first measured before 1/3/91)**



Notes:

1. Measurements to be taken with sail hoisted on the boat under normal rig tension and with sheet pulled tight.
2. Always measure to the bearing surfaces of cringles in luff wire even if the sail material is shorter than this length and/or a Cunningham eye is fitted.
3. The centres of the cringles must be within 26mm of the nearest corner of the sail.

Measuring Equipment: Long & Short measuring tapes, calculator, callipers or gauge set to 15mm, straight edge, indelible marker.

MAINSAIL MEASUREMENT

Rules: 3.2, 11.3.2,5,6, 11.5.4, 11.5.6, 11.8

1. Measurement of Mainsail Cross Widths - Rule 11.3.6

Spread the mainsail out on a flat level surface. Using a biro, mark the cross width measurement points on the leech according to Rule 11.3.6, as shown on the diagram. Unfold the sail and measure the cross widths with a helper holding the sail and tape taut at each measurement point in turn. Find the minimum distance by swinging the tape along the bolt rope, rounding all measurements up to the nearest mm.

2. Batten pockets and battens - Rule 11.3.5

Check that the centreline of the batten pockets falls within 55mm of the corresponding cross width measurement point. Check that the lower two battens are no longer than 765mm and that the top batten does not project more than 100mm from the sail.

3. Insignia and Sail Numbers - Rule 3.2

Check the size and position of the insignia and numerals according to Rule 3.2. (Note: The dimensions required by the Rule prior to 1/3/92 were 280mm height, with width and spacing etc. from ISAF/RYA Racing Rules of Sailing).

4. Check stiffening - Rule 11.8

Check that the body of the sail is flexible, and capable of being folded flat, without permanent damage. Reinforcement is permitted within 320mm of the corners (or Cunningham or reefing eyes. Check that any reinforcement in the tack area has a total height of less than 150mm (including any fittings and eyes). Check that reinforcement can be folded with an outside diameter of 15mm without damage. Check that any tabling which cannot be folded flat is of no more than 40mm maximum width and can be folded with an outside diameter of 15mm. Any other forms of stiffening must be capable of being folded flat without damage.

5. Headboard Projection - Rule 11.3.2

Check that headboard projection is less than 125mm. See diagram.

6. ISAF/RYA Racing Rules of Sailing Requirements - Appendix G3.1(b)

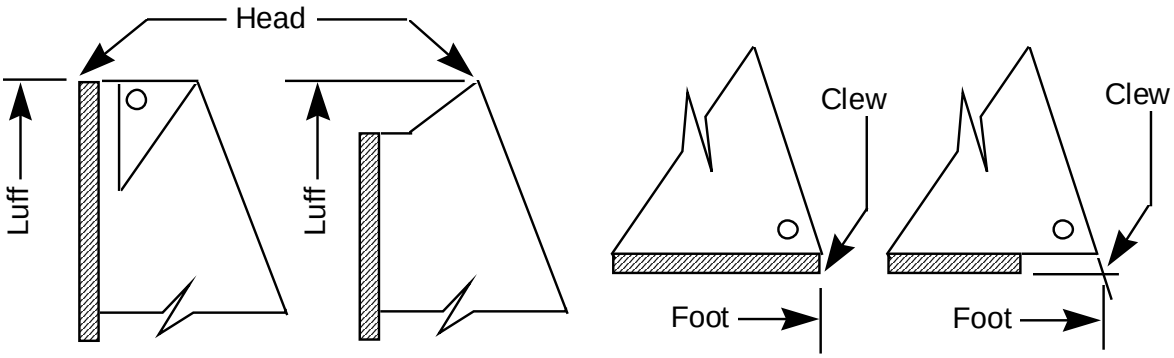
Check that the makers mark is within the larger of 300mm or 15% of the foot length from the tack corner of the sail material.

7. Mark Sail - Rule 11.5.4, 11.5.6

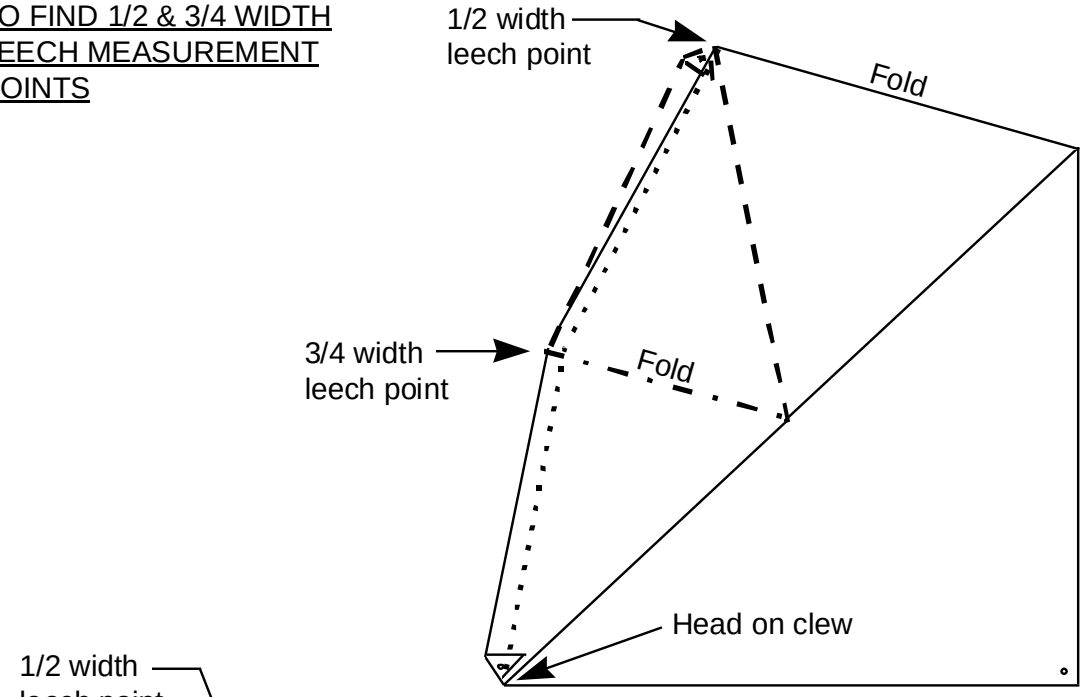
If all is in order, mark the actual cross-width measurements on woven material at the clew of the sail together with signature and date.

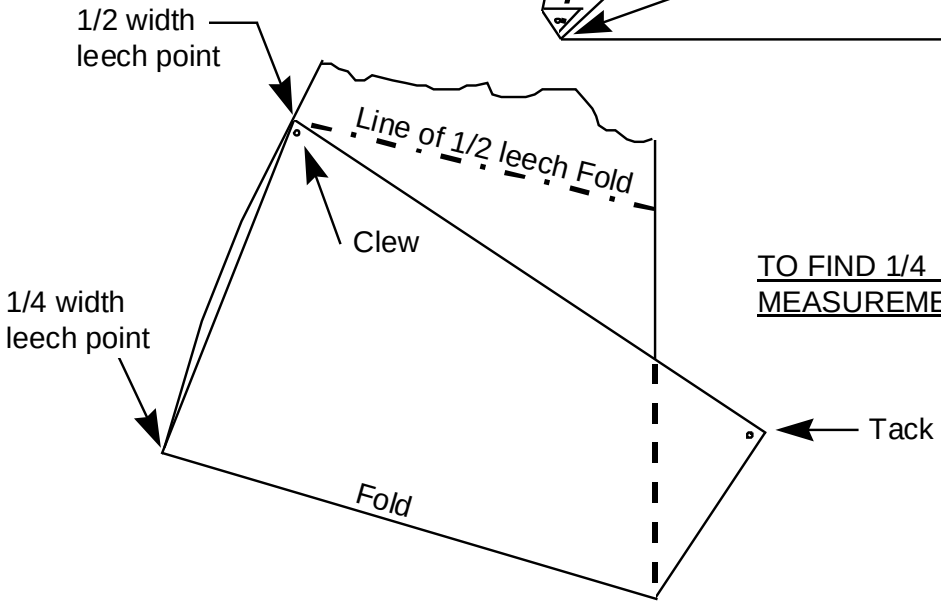
7. Diagrams

7.1.1 Cross Width Measurement Points



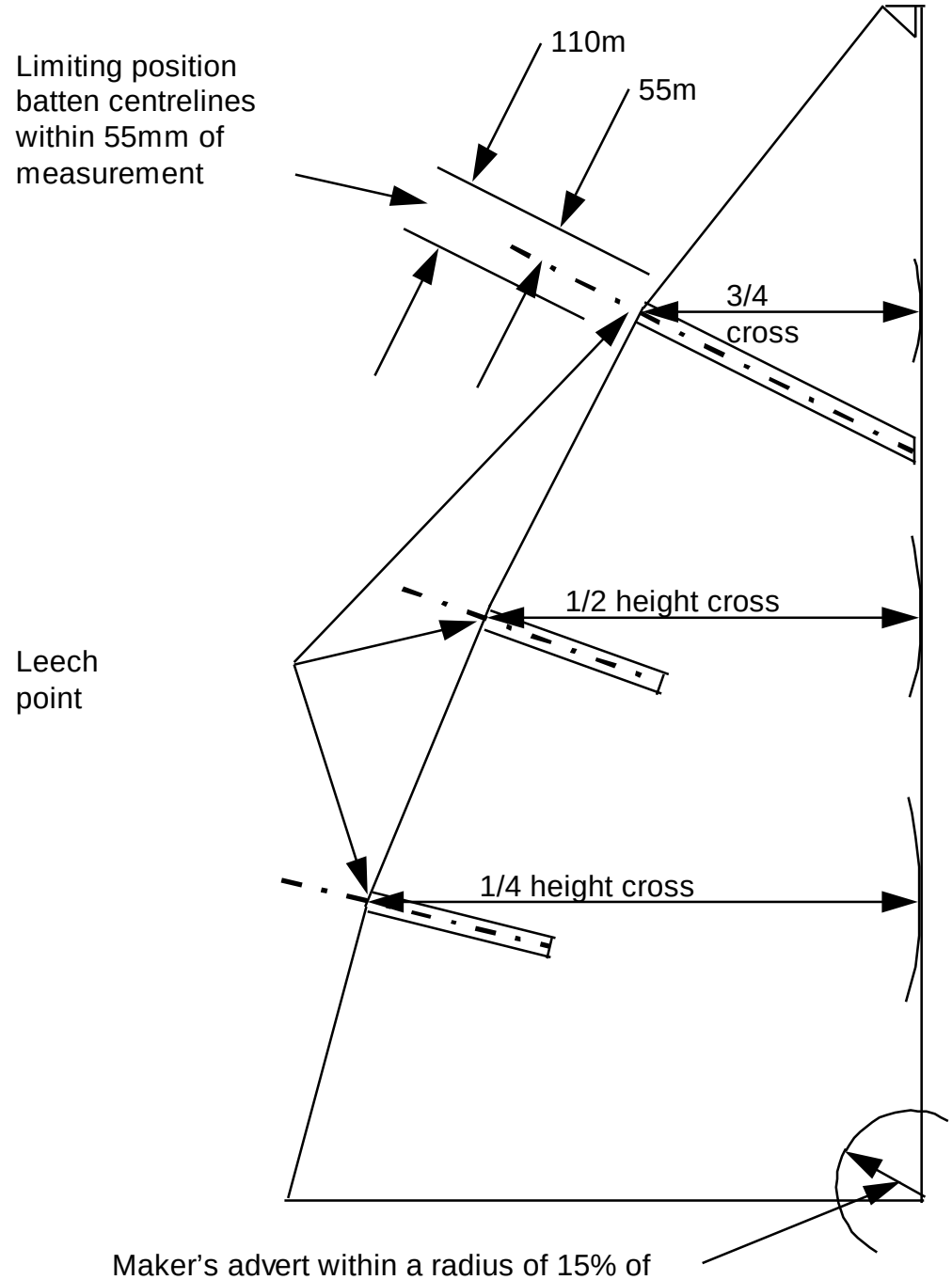
TO FIND 1/2 & 3/4 WIDTH LEECH MEASUREMENT POINTS





TO FIND 1/4 WIDTH LEECH MEASUREMENT POINT

7.1.2 Mainsail Measurements



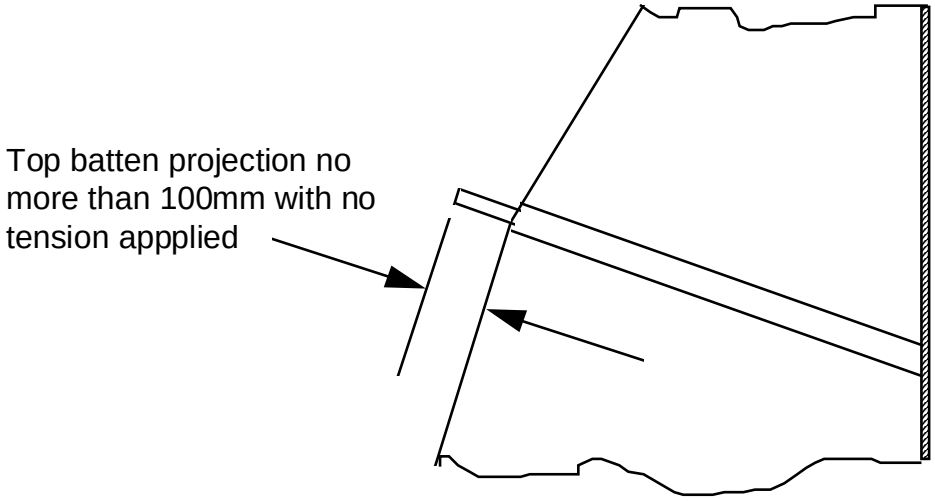
Maker's advert within a radius of 15% of foot or 300mm from tack, whichever is

Maximum Cross	:
at 3/4	580
at 1/2	595 +
at 1/4	395

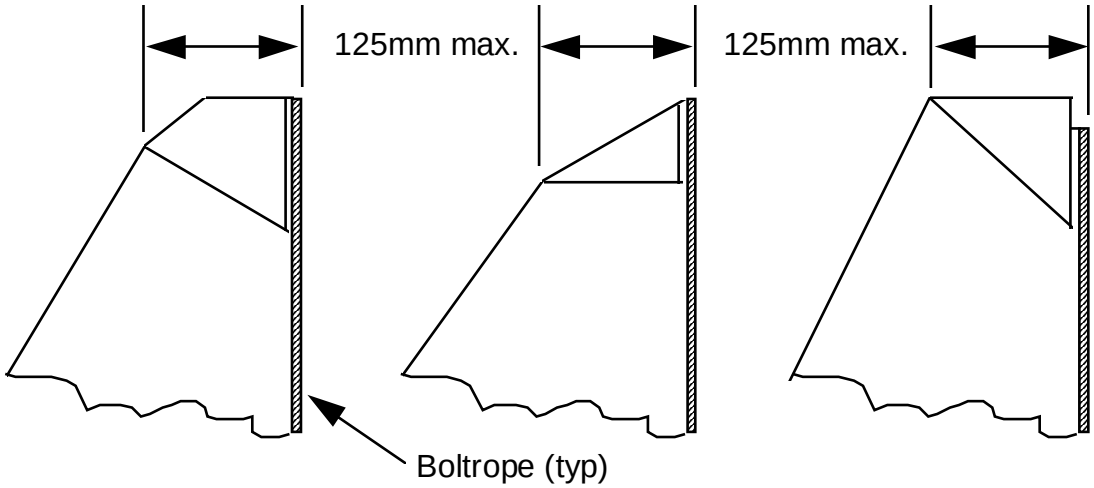
Where F is permitted foot

Cross width measurements are taken over the full width of the including luff

7.2 Batten Projection



7.3 Headboard Projection



Measuring Equipment: Long & Short measuring tapes, straight edge, cross width tables, indelible marker.

NOTE: The are the new rule widths – post 1st January 2007

Foot	1/4	1/2	3/4	Foot	1/4	1/2	3/4	Foot	1/4	1/2	3/4
2000	1895	1595	1080	2050	1932	1620	1092	2100	1970	1645	1105
2001	1895	1595	1080	2051	1933	1620	1092	2101	1970	1645	1105
2002	1896	1596	1080	2052	1934	1621	1093	2102	1971	1646	1105
2003	1897	1596	1080	2053	1934	1621	1093	2103	1972	1646	1105
2004	1898	1597	1081	2054	1935	1622	1093	2104	1973	1647	1106
2005	1898	1597	1081	2055	1936	1622	1093	2105	1973	1647	1106
2006	1899	1598	1081	2056	1937	1623	1094	2106	1974	1648	1106
2007	1900	1598	1081	2057	1937	1623	1094	2107	1975	1648	1106
2008	1901	1599	1082	2058	1938	1624	1094	2108	1976	1649	1107
2009	1901	1599	1082	2059	1939	1624	1094	2109	1976	1649	1107
2010	1902	1600	1082	2060	1940	1625	1095	2110	1977	1650	1107
2011	1903	1600	1082	2061	1940	1625	1095	2111	1978	1650	1107
2012	1904	1601	1083	2062	1941	1626	1095	2112	1979	1651	1108
2013	1904	1601	1083	2063	1942	1626	1095	2113	1979	1651	1108
2014	1905	1602	1083	2064	1943	1627	1096	2114	1980	1652	1108
2015	1906	1602	1083	2065	1943	1627	1096	2115	1981	1652	1108
2016	1907	1603	1084	2066	1944	1628	1096	2116	1982	1653	1109
2017	1907	1603	1084	2067	1945	1628	1096	2117	1982	1653	1109
2018	1908	1604	1084	2068	1946	1629	1097	2118	1983	1654	1109
2019	1909	1604	1084	2069	1946	1629	1097	2119	1984	1654	1109
2020	1910	1605	1085	2070	1947	1630	1097	2120	1985	1655	1110
2021	1910	1605	1085	2071	1948	1630	1097	2121	1985	1655	1110
2022	1911	1606	1085	2072	1949	1631	1098	2122	1986	1656	1110
2023	1912	1606	1085	2073	1949	1631	1098	2123	1987	1656	1110
2024	1913	1607	1086	2074	1950	1632	1098	2124	1988	1657	1111
2025	1913	1607	1086	2075	1951	1632	1098	2125	1988	1657	1111
2026	1914	1608	1086	2076	1952	1633	1099	2126	1989	1658	1111
2027	1915	1608	1086	2077	1952	1633	1099	2127	1990	1658	1111
2028	1916	1609	1087	2078	1953	1634	1099	2128	1991	1659	1112
2029	1916	1609	1087	2079	1954	1634	1099	2129	1991	1659	1112
2030	1917	1610	1087	2080	1955	1635	1100	2130	1992	1660	1112
2031	1918	1610	1087	2081	1955	1635	1100	2131	1993	1660	1112
2032	1919	1611	1088	2082	1956	1636	1100	2132	1994	1661	1113
2033	1919	1611	1088	2083	1957	1636	1100	2133	1994	1661	1113
2034	1920	1612	1088	2084	1958	1637	1101	2134	1995	1662	1113
2035	1921	1612	1088	2085	1958	1637	1101	2135	1996	1662	1113
2036	1922	1613	1089	2086	1959	1638	1101	2136	1997	1663	1114
2037	1922	1613	1089	2087	1960	1638	1101	2137	1997	1663	1114
2038	1923	1614	1089	2088	1961	1639	1102	2138	1998	1664	1114
2039	1924	1614	1089	2089	1961	1639	1102	2139	1999	1664	1114
2040	1925	1615	1090	2090	1962	1640	1102	2140	2000	1665	1115
2041	1925	1615	1090	2091	1963	1640	1102	2141	2000	1665	1115
2042	1926	1616	1090	2092	1964	1641	1103	2142	2001	1666	1115
2043	1927	1616	1090	2093	1964	1641	1103	2143	2002	1666	1115
2044	1928	1617	1091	2094	1965	1642	1103	2144	2003	1667	1116
2045	1928	1617	1091	2095	1966	1642	1103	2145	2003	1667	1116
2046	1929	1618	1091	2096	1967	1643	1104	2146	2004	1668	1116
2047	1930	1618	1091	2097	1967	1643	1104	2147	2005	1668	1116
2048	1931	1619	1092	2098	1968	1644	1104	2148	2006	1669	1117
2049	1931	1619	1092	2099	1969	1644	1104	2149	2006	1669	1117

NOTE: The are the new rule widths – post 1st January 2007

Foot	1/4	1/2	3/4	Foot	1/4	1/2	3/4	Foot	1/4	1/2	3/4
2150	2007	1670	1117	2200	2045	1695	1130	2250	2082	1720	1142
2151	2008	1670	1117	2201	2045	1695	1130	2251	2083	1720	1142
2152	2009	1671	1118	2202	2046	1696	1130	2252	2084	1721	1143
2153	2009	1671	1118	2203	2047	1696	1130	2253	2084	1721	1143
2154	2010	1672	1118	2204	2048	1697	1131	2254	2085	1722	1143
2155	2011	1672	1118	2205	2048	1697	1131	2255	2086	1722	1143
2156	2012	1673	1119	2206	2049	1698	1131	2256	2087	1723	1144
2157	2012	1673	1119	2207	2050	1698	1131	2257	2087	1723	1144
2158	2013	1674	1119	2208	2051	1699	1132	2258	2088	1724	1144
2159	2014	1674	1119	2209	2051	1699	1132	2259	2089	1724	1144
2160	2015	1675	1120	2210	2052	1700	1132	2260	2090	1725	1145
2161	2015	1675	1120	2211	2053	1700	1132	2261	2090	1725	1145
2162	2016	1676	1120	2212	2054	1701	1133	2262	2091	1726	1145
2163	2017	1676	1120	2213	2054	1701	1133	2263	2092	1726	1145
2164	2018	1677	1121	2214	2055	1702	1133	2264	2093	1727	1146
2165	2018	1677	1121	2215	2056	1702	1133	2265	2093	1727	1146
2166	2019	1678	1121	2216	2057	1703	1134	2266	2094	1728	1146
2167	2020	1678	1121	2217	2057	1703	1134	2267	2095	1728	1146
2168	2021	1679	1122	2218	2058	1704	1134	2268	2096	1729	1147
2169	2021	1679	1122	2219	2059	1704	1134	2269	2096	1729	1147
2170	2022	1680	1122	2220	2060	1705	1135	2270	2097	1730	1147
2171	2023	1680	1122	2221	2060	1705	1135	2271	2098	1730	1147
2172	2024	1681	1123	2222	2061	1706	1135	2272	2099	1731	1148
2173	2024	1681	1123	2223	2062	1706	1135	2273	2099	1731	1148
2174	2025	1682	1123	2224	2063	1707	1136	2274	2100	1732	1148
2175	2026	1682	1123	2225	2063	1707	1136	2275	2101	1732	1148
2176	2027	1683	1124	2226	2064	1708	1136	2276	2102	1733	1149
2177	2027	1683	1124	2227	2065	1708	1136	2277	2102	1733	1149
2178	2028	1684	1124	2228	2066	1709	1137	2278	2103	1734	1149
2179	2029	1684	1124	2229	2066	1709	1137	2279	2104	1734	1149
2180	2030	1685	1125	2230	2067	1710	1137	2280	2105	1735	1150
2181	2030	1685	1125	2231	2068	1710	1137	2281	2105	1735	1150
2182	2031	1686	1125	2232	2069	1711	1138	2282	2106	1736	1150
2183	2032	1686	1125	2233	2069	1711	1138	2283	2107	1736	1150
2184	2033	1687	1126	2234	2070	1712	1138	2284	2108	1737	1151
2185	2033	1687	1126	2235	2071	1712	1138	2285	2108	1737	1151
2186	2034	1688	1126	2236	2072	1713	1139	2286	2109	1738	1151
2187	2035	1688	1126	2237	2072	1713	1139	2287	2110	1738	1151
2188	2036	1689	1127	2238	2073	1714	1139	2288	2111	1739	1152
2189	2036	1689	1127	2239	2074	1714	1139	2289	2111	1739	1152
2190	2037	1690	1127	2240	2075	1715	1140	2290	2112	1740	1152
2191	2038	1690	1127	2241	2075	1715	1140	2291	2113	1740	1152
2192	2039	1691	1128	2242	2076	1716	1140	2292	2114	1741	1153
2193	2039	1691	1128	2243	2077	1716	1140	2293	2114	1741	1153
2194	2040	1692	1128	2244	2078	1717	1141	2294	2115	1742	1153
2195	2041	1692	1128	2245	2078	1717	1141	2295	2116	1742	1153
2196	2042	1693	1129	2246	2079	1718	1141	2296	2117	1743	1154
2197	2042	1693	1129	2247	2080	1718	1141	2297	2117	1743	1154
2198	2043	1694	1129	2248	2081	1719	1142	2298	2118	1744	1154
2199	2044	1694	1129	2249	2081	1719	1142	2299	2119	1744	1154

NOTE: The are the old rule widths – pre 31st December 2006

Foot	1/4	1/2	3/4	Foot	1/4	1/2	3/4	Foot	1/4	1/2	3/4
2000	1970	1565	1030	2050	2007	1590	1042	2100	2045	1615	1055
2001	1970	1565	1030	2051	2008	1590	1042	2101	2045	1615	1055
2002	1971	1566	1030	2052	2009	1591	1043	2102	2046	1616	1055
2003	1972	1566	1030	2053	2009	1591	1043	2103	2047	1616	1055
2004	1973	1567	1031	2054	2010	1592	1043	2104	2048	1617	1056
2005	1973	1567	1031	2055	2011	1592	1043	2105	2048	1617	1056
2006	1974	1568	1031	2056	2012	1593	1044	2106	2049	1618	1056
2007	1975	1568	1031	2057	2012	1593	1044	2107	2050	1618	1056
2008	1976	1569	1032	2058	2013	1594	1044	2108	2051	1619	1057
2009	1976	1569	1032	2059	2014	1594	1044	2109	2051	1619	1057
2010	1977	1570	1032	2060	2015	1595	1045	2110	2052	1620	1057
2011	1978	1570	1032	2061	2015	1595	1045	2111	2053	1620	1057
2012	1979	1571	1033	2062	2016	1596	1045	2112	2054	1621	1058
2013	1979	1571	1033	2063	2017	1596	1045	2113	2054	1621	1058
2014	1980	1572	1033	2064	2018	1597	1046	2114	2055	1622	1058
2015	1981	1572	1033	2065	2018	1597	1046	2115	2056	1622	1058
2016	1982	1573	1034	2066	2019	1598	1046	2116	2057	1623	1059
2017	1982	1573	1034	2067	2020	1598	1046	2117	2057	1623	1059
2018	1983	1574	1034	2068	2021	1599	1047	2118	2058	1624	1059
2019	1984	1574	1034	2069	2021	1599	1047	2119	2059	1624	1059
2020	1985	1575	1035	2070	2022	1600	1047	2120	2060	1625	1060
2021	1985	1575	1035	2071	2023	1600	1047	2121	2060	1625	1060
2022	1986	1576	1035	2072	2024	1601	1048	2122	2061	1626	1060
2023	1987	1576	1035	2073	2024	1601	1048	2123	2062	1626	1060
2024	1988	1577	1036	2074	2025	1602	1048	2124	2063	1627	1061
2025	1988	1577	1036	2075	2026	1602	1048	2125	2063	1627	1061
2026	1989	1578	1036	2076	2027	1603	1049	2126	2064	1628	1061
2027	1990	1578	1036	2077	2027	1603	1049	2127	2065	1628	1061
2028	1991	1579	1037	2078	2028	1604	1049	2128	2066	1629	1062
2029	1991	1579	1037	2079	2029	1604	1049	2129	2066	1629	1062
2030	1992	1580	1037	2080	2030	1605	1050	2130	2067	1630	1062
2031	1993	1580	1037	2081	2030	1605	1050	2131	2068	1630	1062
2032	1994	1581	1038	2082	2031	1606	1050	2132	2069	1631	1063
2033	1994	1581	1038	2083	2032	1606	1050	2133	2069	1631	1063
2034	1995	1582	1038	2084	2033	1607	1051	2134	2070	1632	1063
2035	1996	1582	1038	2085	2033	1607	1051	2135	2071	1632	1063
2036	1997	1583	1039	2086	2034	1608	1051	2136	2072	1633	1064
2037	1997	1583	1039	2087	2035	1608	1051	2137	2072	1633	1064
2038	1998	1584	1039	2088	2036	1609	1052	2138	2073	1634	1064
2039	1999	1584	1039	2089	2036	1609	1052	2139	2074	1634	1064
2040	2000	1585	1040	2090	2037	1610	1052	2140	2075	1635	1065
2041	2000	1585	1040	2091	2038	1610	1052	2141	2075	1635	1065
2042	2001	1586	1040	2092	2039	1611	1053	2142	2076	1636	1065
2043	2002	1586	1040	2093	2039	1611	1053	2143	2077	1636	1065
2044	2003	1587	1041	2094	2040	1612	1053	2144	2078	1637	1066
2045	2003	1587	1041	2095	2041	1612	1053	2145	2078	1637	1066
2046	2004	1588	1041	2096	2042	1613	1054	2146	2079	1638	1066
2047	2005	1588	1041	2097	2042	1613	1054	2147	2080	1638	1066
2048	2006	1589	1042	2098	2043	1614	1054	2148	2081	1639	1067
2049	2006	1589	1042	2099	2044	1614	1054	2149	2081	1639	1067

OLD RULE **OLD RULE**

NOTE: The are the old rule widths – pre 31st December 2006

Foot	1/4	1/2	3/4	Foot	1/4	1/2	3/4	Foot	1/4	1/2	3/4
2150	2082	1640	1067	2200	2120	1665	1080	2250	2157	1690	1092
2151	2083	1640	1067	2201	2120	1665	1080	2251	2158	1690	1092
2152	2084	1641	1068	2202	2121	1666	1080	2252	2159	1691	1093
2153	2084	1641	1068	2203	2122	1666	1080	2253	2159	1691	1093
2154	2085	1642	1068	2204	2123	1667	1081	2254	2160	1692	1093
2155	2086	1642	1068	2205	2123	1667	1081	2255	2161	1692	1093
2156	2087	1643	1069	2206	2124	1668	1081	2256	2162	1693	1094
2157	2087	1643	1069	2207	2125	1668	1081	2257	2162	1693	1094
2158	2088	1644	1069	2208	2126	1669	1082	2258	2163	1694	1094
2159	2089	1644	1069	2209	2126	1669	1082	2259	2164	1694	1094
2160	2090	1645	1070	2210	2127	1670	1082	2260	2165	1695	1095
2161	2090	1645	1070	2211	2128	1670	1082	2261	2165	1695	1095
2162	2091	1646	1070	2212	2129	1671	1083	2262	2166	1696	1095
2163	2092	1646	1070	2213	2129	1671	1083	2263	2167	1696	1095
2164	2093	1647	1071	2214	2130	1672	1083	2264	2168	1697	1096
2165	2093	1647	1071	2215	2131	1672	1083	2265	2168	1697	1096
2166	2094	1648	1071	2216	2132	1673	1084	2266	2169	1698	1096
2167	2095	1648	1071	2217	2132	1673	1084	2267	2170	1698	1096
2168	2096	1649	1072	2218	2133	1674	1084	2268	2171	1699	1097
2169	2096	1649	1072	2219	2134	1674	1084	2269	2171	1699	1097
2170	2097	1650	1072	2220	2135	1675	1085	2270	2172	1700	1097
2171	2098	1650	1072	2221	2135	1675	1085	2271	2173	1700	1097
2172	2099	1651	1073	2222	2136	1676	1085	2272	2174	1701	1098
2173	2099	1651	1073	2223	2137	1676	1085	2273	2174	1701	1098
2174	2100	1652	1073	2224	2138	1677	1086	2274	2175	1702	1098
2175	2101	1652	1073	2225	2138	1677	1086	2275	2176	1702	1098
2176	2102	1653	1074	2226	2139	1678	1086	2276	2177	1703	1099
2177	2102	1653	1074	2227	2140	1678	1086	2277	2177	1703	1099
2178	2103	1654	1074	2228	2141	1679	1087	2278	2178	1704	1099
2179	2104	1654	1074	2229	2141	1679	1087	2279	2179	1704	1099
2180	2105	1655	1075	2230	2142	1680	1087	2280	2180	1705	1100
2181	2105	1655	1075	2231	2143	1680	1087	2281	2180	1705	1100
2182	2106	1656	1075	2232	2144	1681	1088	2282	2181	1706	1100
2183	2107	1656	1075	2233	2144	1681	1088	2283	2182	1706	1100
2184	2108	1657	1076	2234	2145	1682	1088	2284	2183	1707	1101
2185	2108	1657	1076	2235	2146	1682	1088	2285	2183	1707	1101
2186	2109	1658	1076	2236	2147	1683	1089	2286	2184	1708	1101
2187	2110	1658	1076	2237	2147	1683	1089	2287	2185	1708	1101
2188	2111	1659	1077	2238	2148	1684	1089	2288	2186	1709	1102
2189	2111	1659	1077	2239	2149	1684	1089	2289	2186	1709	1102
2190	2112	1660	1077	2240	2150	1685	1090	2290	2187	1710	1102
2191	2113	1660	1077	2241	2150	1685	1090	2291	2188	1710	1102
2192	2114	1661	1078	2242	2151	1686	1090	2292	2189	1711	1103
2193	2114	1661	1078	2243	2152	1686	1090	2293	2189	1711	1103
2194	2115	1662	1078	2244	2153	1687	1091	2294	2190	1712	1103
2195	2116	1662	1078	2245	2153	1687	1091	2295	2191	1712	1103
2196	2117	1663	1079	2246	2154	1688	1091	2296	2192	1713	1104
2197	2117	1663	1079	2247	2155	1688	1091	2297	2192	1713	1104
2198	2118	1664	1079	2248	2156	1689	1092	2298	2193	1714	1104
2199	2119	1664	1079	2249	2156	1689	1092	2299	2194	1714	1104

OLD RULE

OLD RULE

PROHIBITIONS

Rules: 9.1, 9.2, 9.5, 11.7, 13.1, 13.2

1. Spars - Rules 9.1, 9.2 & 9.5

A single Mast only is permitted. A subsidiary strut or spar attached to the Mast or Boom and used to support rigging is classed as a Jumper Strut. One set of spreaders or cross-trees is permitted, linked to the shrouds or independent rigging. Permanently bent Masts and Booms are prohibited. These must be straight when all external rigging tension is released.

2. Sails - Rule 11.7

Spinnakers and double luffed sails are prohibited. A double luff exists when the material of the sail is sleeved so that it slides up and encloses rigging or a spar which is not part of the (permitted) sail reinforcement. The luff wire of the jib is an exception.

3. General Prohibitions - Rules 13.1 & 13.2

Bowsprits, Bumpkins and Outriggers are all spars fitted outside the Sheerline to support rigging and/or sail control lines. The other prohibitions are self-explanatory.

ADVERTISING

1. Advertising – Rule 14.1

ISAF Advertising Code Category C. This permits advertising on the hull, mainsail and spars as specified in ACC C

BUOYANCY TESTING

Rules: 6.3, 6.4

Note : INITIAL BOUYANCY TESTING AND ANNUAL BOUYANCY CHECKS ARE CARRIED OUT BY THE OWNER NOT THE MEASURER.

1. Wet Test - Rules 6.3, 6.4

The wet test must be used on first measurement and at least every three years thereafter. The test is carried out with Mast stepped and Boom and loose gear removed.

1.1 Upright test - Rule 6.3.1

Ideally the Boat is tested using weights, if people are used check that their combined weight is at least 180kg (28 $^{1}/_{2}$ stone). The weights/people should be evenly distributed about a point 1500mm forward of the Transom (i.e. with their combined centre of gravity at 1500mm forward of the Transom). The Boat is swamped and should float approximately level for at least 10 minutes.

1.2 Side test - Rule 6.3.2

This test is only compulsory on initial measurement. The Boat is turned on its side and the Mast is supported above the upper coloured band so that it is horizontal. The Boat is to support at least 135kg (21½ stone). This is best done using people as ballast to avoid damage.

1.3 Leakage and Condition - Rule 6.3.3

Immediately after the test(s) check that the total leakage does not exceed 1.5 litres. Also check that inflatable buoyancy has not deflated and that the condition of all fastenings and apparatus is sound.

Measuring Equipment: Weights/people to 180kg (approx. 28½ stone), long tape, sponge, measuring jug.

2. Air Test - Rules 6.3.4 & 6.3.5

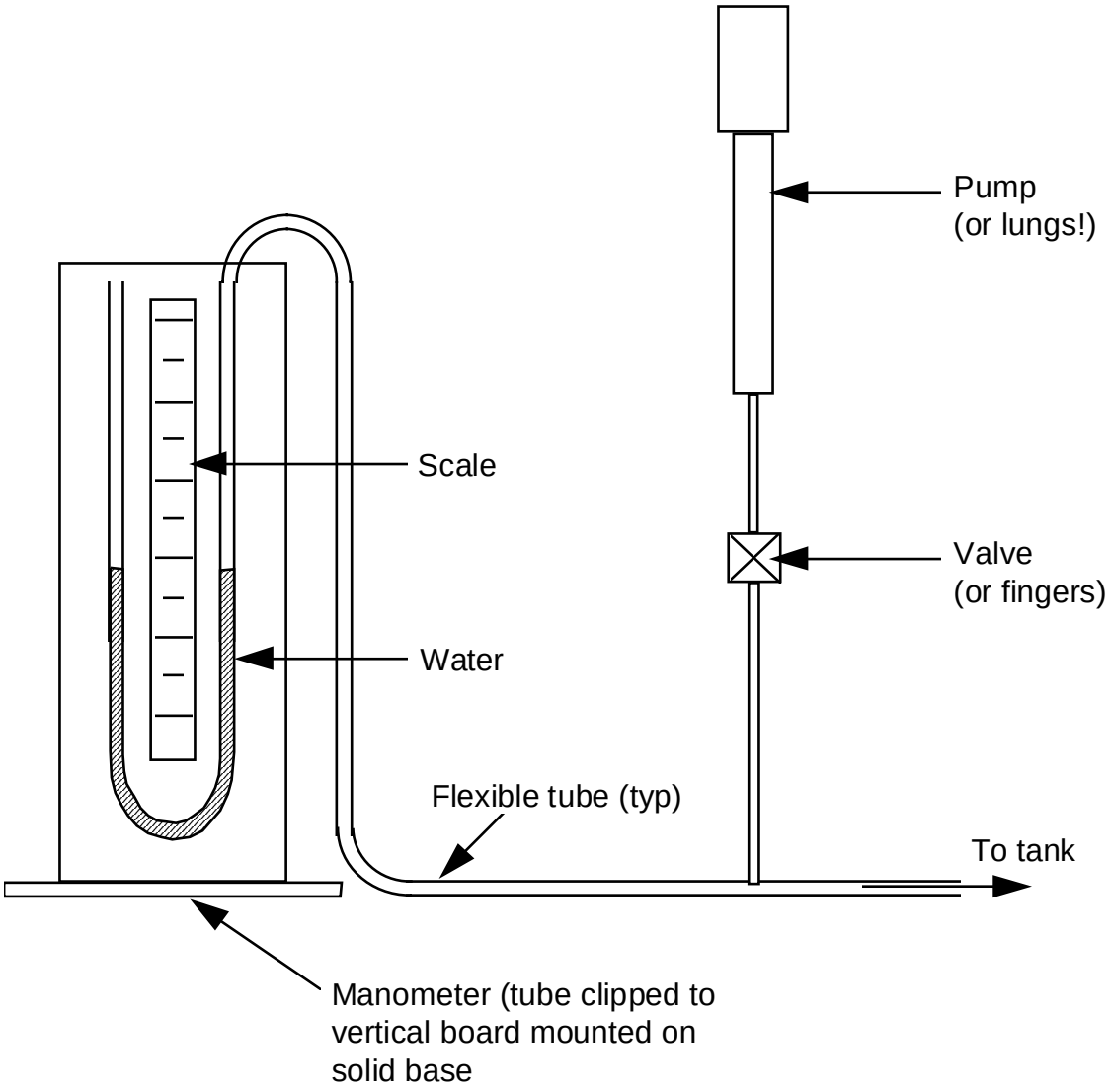
Between the triennial wet tests, air testing may be used providing there is no doubt about the general condition of the buoyancy, all buoyancy units are built in and the owner is satisfied that there have been no changes to the equipment. The three tanks must each have a bung hole or hatch cover to allow connection of the Manometer used to measure the pressure difference.

The manometer is constructed from a 'U' tube which is half filled with water mounted vertically against a scale at least 200mm long. One end of the 'U' tube is connected via a flexible pipe to the buoyancy tank using a suitably drilled bung or hatch cover. The other end is left open. A pressure device (human lungs or bicycle pump?) is connected via a valve to the flexible pipe between the tank and the 'U' tube. The pump is operated until the difference in water levels is 125mm and the valve is closed. The difference in water levels must not drop below 50mm within 30 seconds.

2. Air Test (continued)

Where two units are divided by a partition the closure of the unit not being tested should be removed as a check that the units are independent.

3. Diagram



Measuring Equipment: Manometer, flexible tube, drilled bung/hatch cover, pump, valve, stop watch.

LIST OF MEASURING EQUIPMENT

Item	Rule(s)
Large calibrated scales to weigh > 100kg	8.2
Small calibrated scales to weigh > 15kg	8.1, 8.3
Weighing slings or strongback	8.2
Strop	8.2
Centre punch and hammer	8.3
Indelible felt-tip pen	8.1, 11.3.1, 11.5.2, 11.5.4
Circle jig (Page 5)	9.5
Callipers	5.2.1, 5.2.2, 5.4, 9.3, 11.8
Long tape >7m, calibrated in mm	4.1, 4.2, 6.3.1, 9.3, 10.1, 10.2, 11.3.1, 11.4.2
Short tape >2m, calibrated in mm	4.3.2, 4.3.3, 4.4.1, 4.4.2, 5.2.1, 5.2.2, 5.3, 5.4, 6.1, 6.2, 8.1, 11.3.2, 11.3.3, 11.3.6, 11.4.3
Long spirit level >1m (to work vertically and horizontally)	4.1, 4.2, 4.3.2, 4.3.3, 4.4.1, 4.4.2, 5.2.2
Short spirit level (to work vertically and horizontally)	4.3.1
Water tube >5m, bore >15mm at ends	4.1, 4.2
Jack (self supporting)	4.1, 4.2, 4.4.1
Straight edge(s) >2.5m	4.1, 4.2, 4.3.2, 4.4.1, 4.4.2, 5.2.1, 5.2.2, 7.2
Straight edge >0.75m	4.1, 4.3.1, 5.3, 11.3
Waterproof tape or crayon	4.1?
Buoyancy test weights (180kg)	4.1?, 6.3.1
Sheerline jig (Page 9)	4.2, 4.3.1, 4.4.2, 5.3, 7.2, 9.3, 10.1, 10.2, 11.3.1
Masking tape and pencil	4.2, 4.3.1, 4.3.3, 5.3, 7.2
Thin string/whipping twine	4.2, 5.3
G clamps	4.2, 5.2.2
Plumb bob	4.4.1, 4.4.2
Short rule (150 or 300mm)	3.1, 4.3.1, 4.4.1, 7.2, 10.2, 11.3.1
Depth at Midlength jig (Page 12)	4.4.1
Gunwale width jig (Page 14)	4.3.1
Micrometer?	5.2.1, 5.2.2, 5.4
Calculator	6.1, 6.2, 11.3.4, 11.4.4, 11.1
Rise of floor jig (Page 20)	4.3.3, 5.3
Scriber (optional)	9.3, 10.1, 11.3.1. 11.3.3, 11.5.1
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Set square	11.3.3
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