

Sailmakers's guide – Carbon Spars

Additional information for Carbon yacht and keelboat masts and booms

This guide is to intended for use when Carbon masts or booms are supplied. It covers all likely combinations of carbon/carbon and carbon/aluminium spars. It does not include spinnaker poles or bowsprits.

For more extensive details of the Seldén product range and dimensions, use the standard Seldén Sailmaker's guide 595-542-E

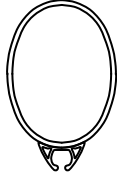
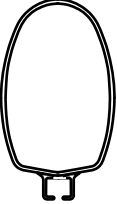
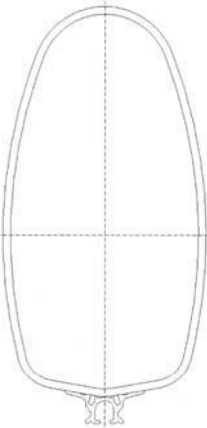
Special instructions

1. On carbon masts, all sail foot "E" dimensions are measured from the aft edge of the external sail track. This is based on ISAF Equipment Rules 2009-2012, Rule F 2.3 (m) (i) which defines Mast Spar Cross Section in the Fore-and-Aft direction as "including any sail track".
2. The dimensions for all sail entries, tack & reefline connections are only for Seldén track. If another manufacture's track is used, standard dimension may be incorrect. Detailed tack dimensions are measured from the mast section rear face, not the sail track.
3. Dimensions for Aluminium booms when used on carbon masts assume that they will be the "new" range, i.e. 2008 onwards.

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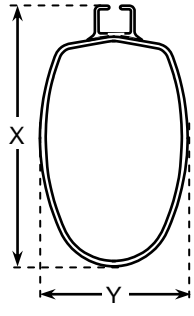
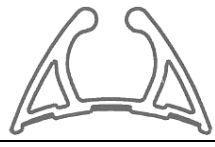
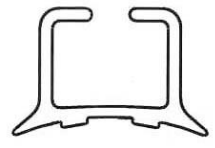
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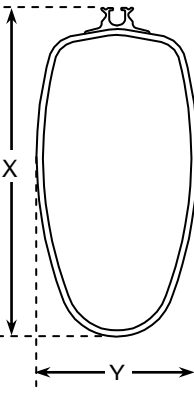

2.1.1 Carbon Mast Section Properties

	Section	Section inc. Track		Section inc. Track		Section inc. Track	
		No extra F&A Reinf. (Sect.No. ends -x0)		Single F&A Reinf. (Sect.No. ends -x1)		Double F&A Reinf. (Sect.No. ends -x2)	
		Ely (GNmm ²)	Wy (cm ³)	Ely (GNmm ²)	Wy (cm ³)	Ely (GNmm ²)	Wy (cm ³)
	CC079-21	21	8	23		26	
	CC079-24	24	9	27		29	
	CC079-30	34	12	36		39	
	CC086-24	30	11	33		36	
	CC086-30	41	13	45		47	
	CC095-24	41	13	44		48	
	CC095-30	56	16	59		63	
	CC105-24	72	16	80		88	
	CC105-30	93	20	101		110	
	CC115-24	92	19	101		111	
	CC115-30	119	24	129		139	
	CC125-24	113	23	124		136	
	CC125-30	148	28	159		171	
	CC125-36	182	31	194		206	
	CC138-30	194	34	209		223	
	CC138-36	240	41	254		269	
	CC154-30	302	40	335		365	
	CC154-36	367	49	399		432	
	CC174-30	418	51	460		501	
	CC174-36	508	61	550		594	
	CC192-36	648	72	699		751	
	CC192-42	763	85	815		867	
	CC210-36	824	85	887		951	
	CC210-42	972	100	1036		1099	
	CC226-36	1005	98	1078		1152	
	CC226-42	1185	115	1259		1335	
	Section	Section inc. Track		Section inc. Track		Section inc. Track	
		No extra F&A Reinf. (Sect.No. ends -x0)		Single F&A Reinf. (Sect.No. ends -x2)		Double F&A Reinf. (Sect.No. ends -x4)	
		Ely (GNmm ²)	Wy (cm ³)	Ely (GNmm ²)	Wy (cm ³)	Ely (GNmm ²)	Wy (cm ³)
	CC244-42	1467	134	1641		1812	
CC244-48	1691	153	1868		2044		
CC263-48	2061	176	2264		2470		
CC263-54	2336	199	2542		2750		
CC284-48	2564	205	2804		3041		
CC284-54	2907	231	3150		3393		
CC303-54	3488	262	3762		4034		
CC303-60	3901	292	4180		4458		

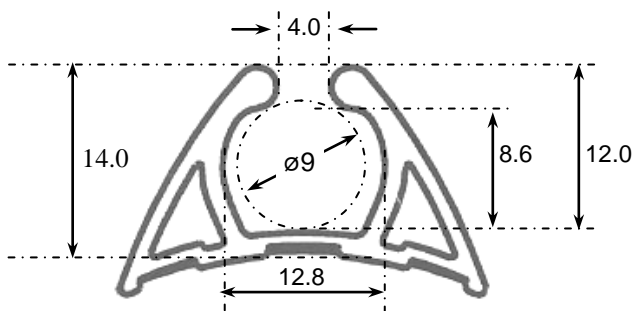
1) Sections not available yet.

2.1.2 Carbon Mast Sail Tracks

Carbon Keelboat Mast Sections				External Sail Track Scale 1:1
	Section	Dimn X	Dimn Y	
	CC077	94	60	
	CC086	101	61	
	CC095	110	68	
	CC105	120	71	
	CC115	130	74	
	CC125	140	78	
	CC138	154	85	

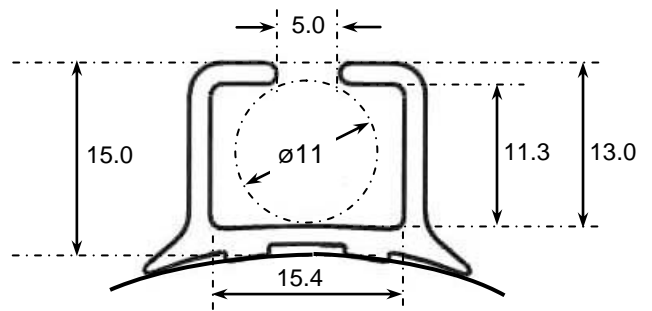
Carbon Yacht Mast Sections				External Sail Track Scale 1:1
	Section	Dimn X	Dimn Y	
	CC154	172	87	
	CC174	192	93	
	CC192	210	102	
	CC210	228	110	
	CC226	243	118	
	CC244	262	127	
	CC263	281	136	
	CC284	301	146	Custom track & car systems
CC303	321	156		

Small Carbon Keelboat Sail Track



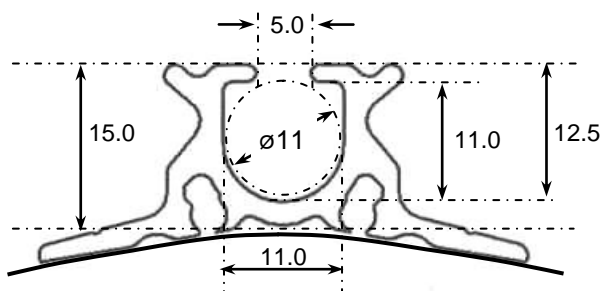
Recommended bolt rope $\phi 8\text{mm}$

Large Carbon Keelboat Sail Track



Recommended bolt rope $\phi 10\text{mm}$

Carbon Yacht Sail Track Detail



Recommended bolt rope $\phi 10\text{mm}$

The yacht sail track can be used for boltrope luff sails, or with external RCB22 cars.

To change function from cars to boltrope is simple. See details on page [2.3.2](#)

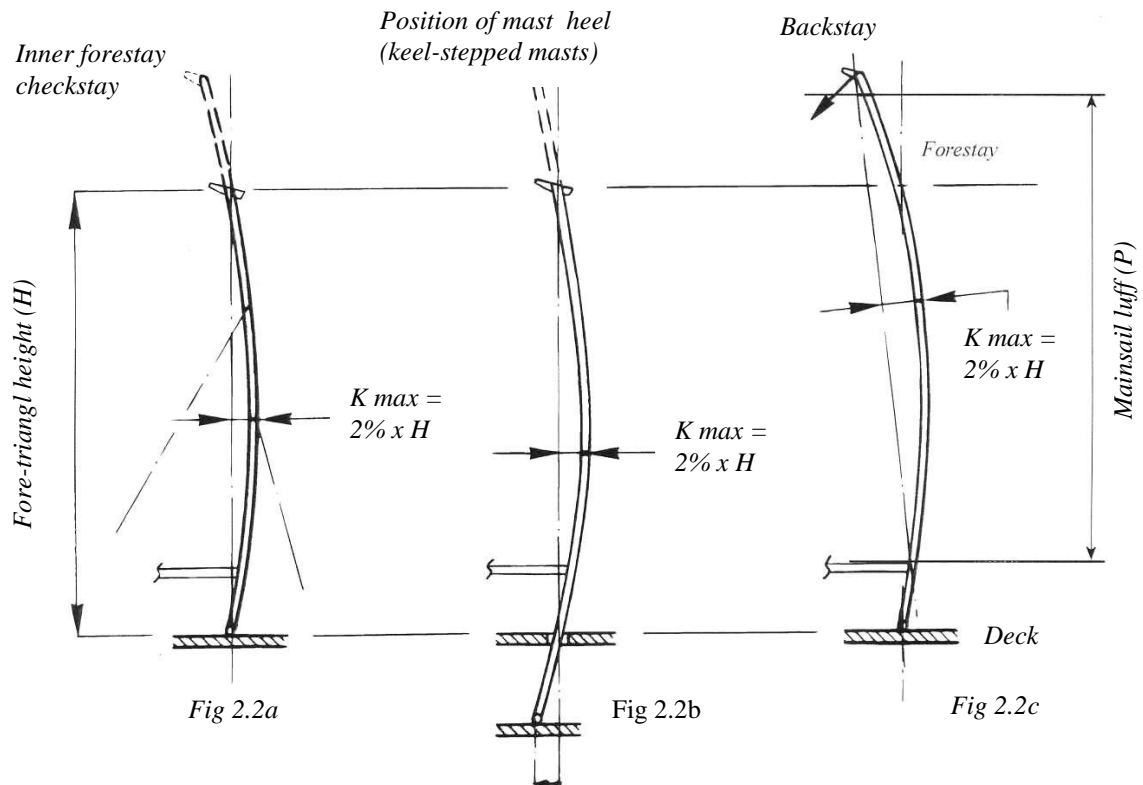
2.2.1 Carbon Mast Deflection Curves

Seldén carbon spars and fittings are designed to operate with a maximum longitudinal deflection of 2% of the fore-triangle height (H). On fractional rigs the maximum deflection can be taken as being 2% of the mainsail Luff (P). These values are guiding principles only.

The conditions are:



- 1) The mast forms an even curve (convex front) from deck level to masthead.
- 2) The deflection must be kept within the stated values, even in rough seas, by suitable longitudinal staying.

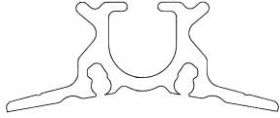
The deflection curve is formed by:



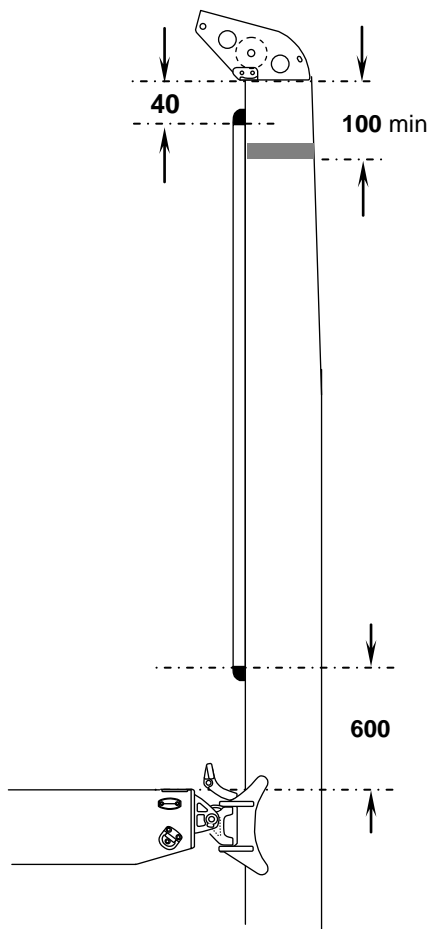
It may be possible to increase the above values on some masts. However, in such cases the Customer must request a special calculation for this from Seldén Mast, and have our written agreement for the increase in deflection depth

2.3.1 Carbon Mast Track and Sail Entry

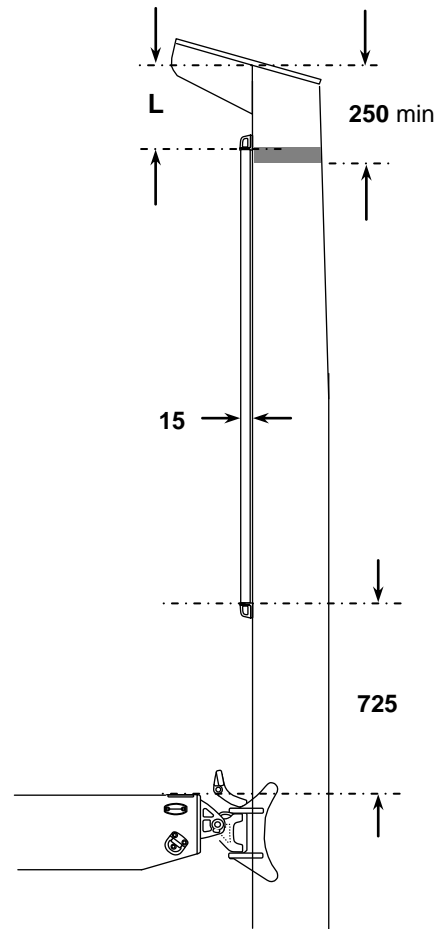
Carbon Keelboat Masts	
Section	Track (Details p2.2)
CC077 CC086 CC095	
CC105 CC115 CC125 CC138	

Carbon Yacht Masts			
Section	L Fract	L Fract + MH Spin	Track (Details p2.2)
CC154 CC174	165	175	
CC192 CC210 CC226 CC244 CC263	185	200	
CC284 CC303	Custom arrangement. Contact Seldén Masts		

Carbon Keelboat Masts

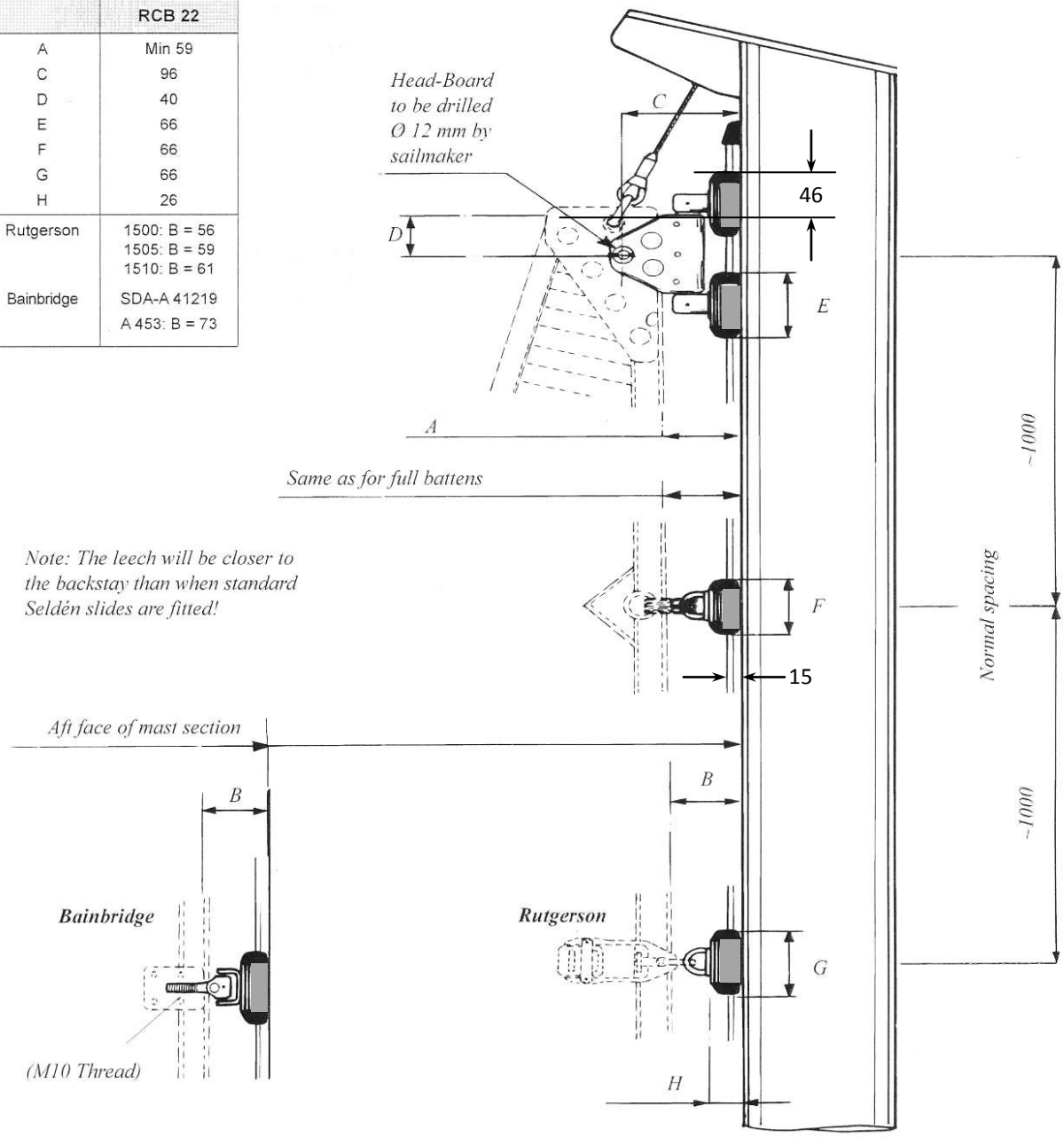


Carbon Yacht Masts



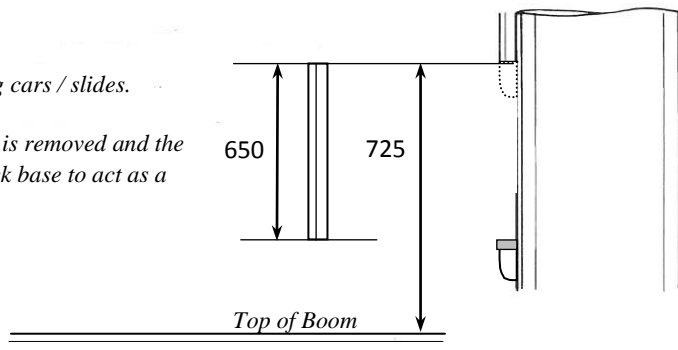
2.3.2 Carbon Yacht Masts - RCB22 Track System Layout

RCB 22	
A	Min 59
C	96
D	40
E	66
F	66
G	66
H	26
Rutgerson	1500: B = 56 1505: B = 59 1510: B = 61
Bainbridge	SDA-A 41219 A 453: B = 73



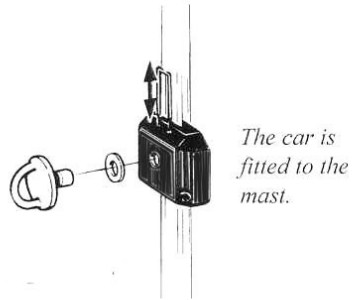
Removable track section for loading cars / slides.

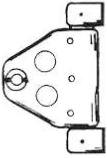
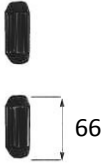
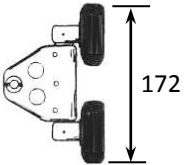









If sail luff has a boltrope, the section is removed and the lower stop moved up to the main track base to act as a feeder (shown with dotted outline).



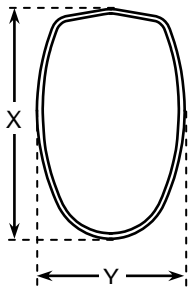
2.3.3 RCB22 Parts

The slide attachment eye is easily detached from the slide and can be



		Connectors	Car	Total assembly
Head-board car				
	RCB 22	511-595-11	511-703-11	511-595-11+ 2x 511-703-11
Batten car All-Round: Fits Rutgerson batten fitting and others				
	RCB 22	511-590-01		511-703-04
Batten car With M-10 screw: Fits Bainbridge batten fitting and others				
	RCB 22	511-598-01		511-703-03
Sail car (See note)				
	RCB 22	511-590-01		511-703-11

3.1 Carbon Booms

Carbon Boom Sections				Boom End Functions		
	Section	Dimn X	Dimn Y	Outboard End	Inboard End	Single Line Reef
	BC086	84	62	Outhaul only	2 reef + outhaul	None
	BC115	115	74	2 reef + outhaul	2 reef + outhaul	2 SL Reef
	BC138	138	84	2 reef + outhaul	2 reef + outhaul	2 SL Reef
	BC154	157	87	2 reef + outhaul	2 reef + outhaul	2 SL Reef
	BC174	179	93	2 reef + outhaul	2 reef + outhaul	2 SL Reef
	BC192	198	103	3 reef + outhaul	3 reef + outhaul	2 SL Reef
	BC244	249	127	3 reef + outhaul	3 reef + outhaul	2 SL Reef
	BC303	307	161	3 reef + outhaul	3 reef + outhaul	2 SL Reef

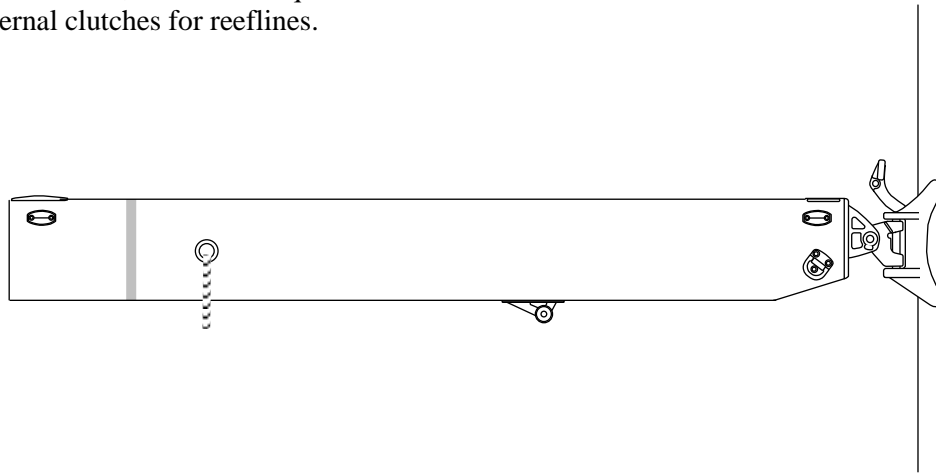
Details:

Boom cross section is plain oval. No track for sail foot or underboom attachments.

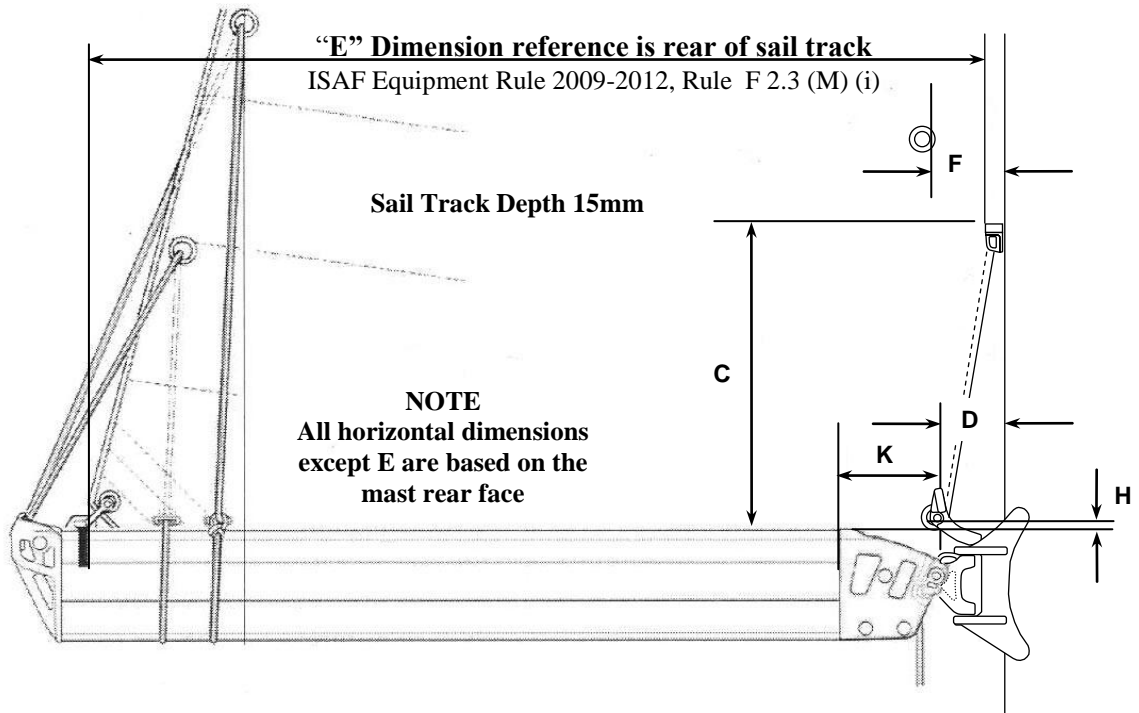
Kicker attachment position is fixed.

Sails have a loose foot, clew band required.

Optional internal clutches for reeflines.



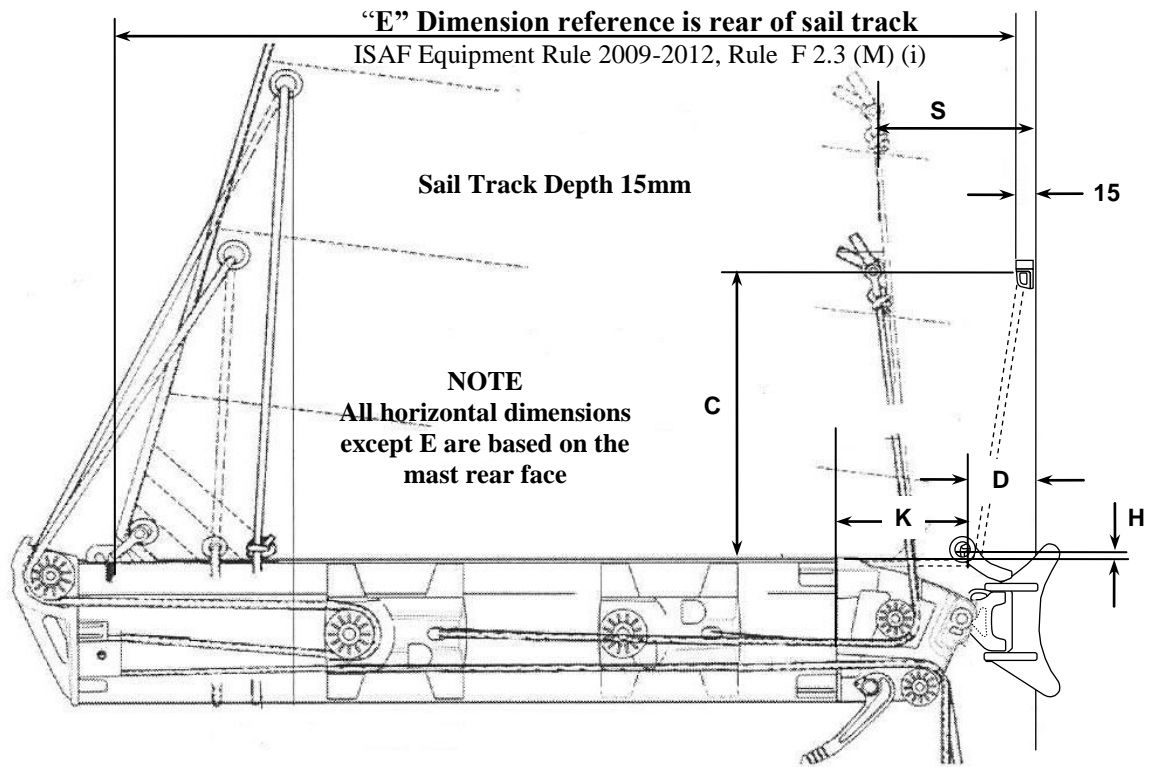
4.1.1 Aluminium Slab Reef Boom on Carbon Mast



Mast Section		Boom Section	Sail foot groove	Sail feeder “cut back”			Tack		Reef hooks		
				C RCB Track	C Bolt rope	K	D	H	F		
CC079 – CC138		B087	5.5± 0.75	–	600	55	55	0	70		
CC079 – CC138		B104		–	600	55	55	0	70		
CC115 – CC138		B120		–	600	55	55	0	70		
CC115 – CC138		B135		–	600	135	65	10	75		
CC138		B152		–	600	135	65	5	75		
CC154 – CC192		B120	5.5± 0.75	190	725	150	80	25	80		
		B135				105	80	25	80		
		B152				105	80	15	80		
		B171				120	80	15	80		
CC210 – CC244		B120	5.5± 0.75			150	85	25	85		
		B135				105	85	25	85		
		B152				105	85	15	85		
		B171				120	85	10	85		
CC210 – CC226		B200	6.25± 0.75			190 (Not 303)	725	220	85	10	85
CC244 – CC303		B200	175					100	10	110	
CC263 – CC284		B171	5.5± 0.75					135	100	40	110
CC263 – CC303		B250	6.25± 0.75					175	100	10	110
CC263 – CC303		B290	75	100	30			Running hooks			
CC263 – CC303		B300	75	100	30						

For detail of aluminium boom functions and clew arrangements, see the main Seldén Sailmakers Guide 595-542-E

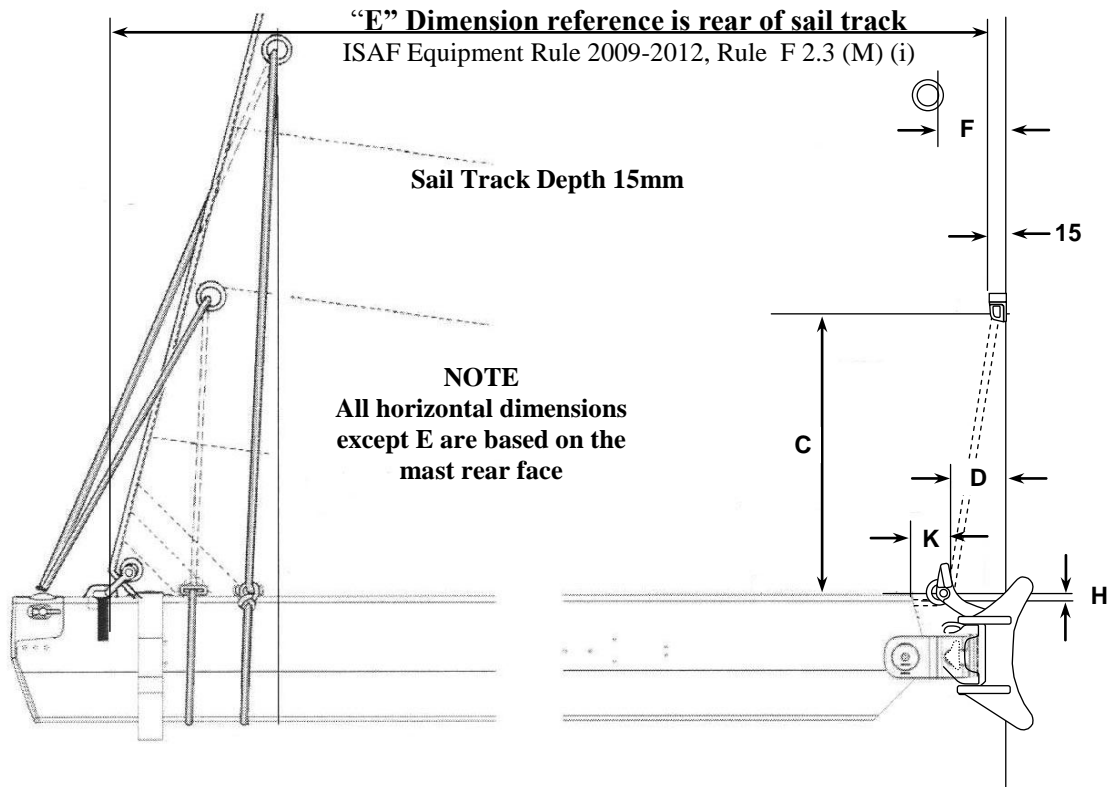
4.1.2 Aluminium Single Line Reef Boom on Carbon Mast



Mast Section	Boom Profile	Boom Section	Sail foot groove	Sail feeder “cut back”			Tack		SL Reef	Max Ht Reef 1 (Stbd) mm	Max Ht Reef 2 (Port) mm
				C RCB Track	C Bolt Rope	K	D	H			
CC079 – CC139		B087	5.5± 0.75	–	600	55	55	0	95	E-1650	E-420
CC079 – CC139		B104	5.5± 0.75	–	600	55	55	0	95	E-1650	E-420
CC125 – CC139		B120	5.5± 0.75	–	600	55	55	0	95	E-1650	E-420
CC115 – CC138		B135	5.5± 0.75	–		135	65	10	160	E-1800	E-600
CC138		B152	5.5± 0.75	–		135	65	5	160	E-1800	E-750
CC154 – CC192		B120	5.5± 0.75	190	725	150	80	30	120	E-1800	E-600
		B135	5.5± 0.75			105	80	25	165	E-1800	E-650
		B152	5.5± 0.75			105	80	15	165	E-1800	E-750
		B171	5.5± 0.75			120	80	15	165	E-1900	E-850
CC210 – CC244		B120	5.5± 0.75			150	85	30	125	E-1800	E-600
		B135	5.5± 0.75			105	85	25	170	E-1800	E-650
		B152	5.5± 0.75			105	85	15	170	E-1800	E-750
		B171	5.5± 0.75			120	85	15	170	E-1900	E-850
CC210 – CC226		B200	6.25± 0.75			220	85	10	240	E-2000	E-950
CC244 – CC303		B200	6.25± 0.75			175	100	10	240	E-2000	E-950
CC263 – CC303		B171	5.5± 0.75			135	100	40	200	E-1900	E-850
CC263 – CC303		B250	6.25± 0.75			175	100	10	240	E-2500	E-1100

For detail of aluminium boom functions and clew arrangements, see the main Seldén Sailmakers Guide 595-542-E

4.2.1 Aluminium Match Slab Reef Boom on Carbon Mast

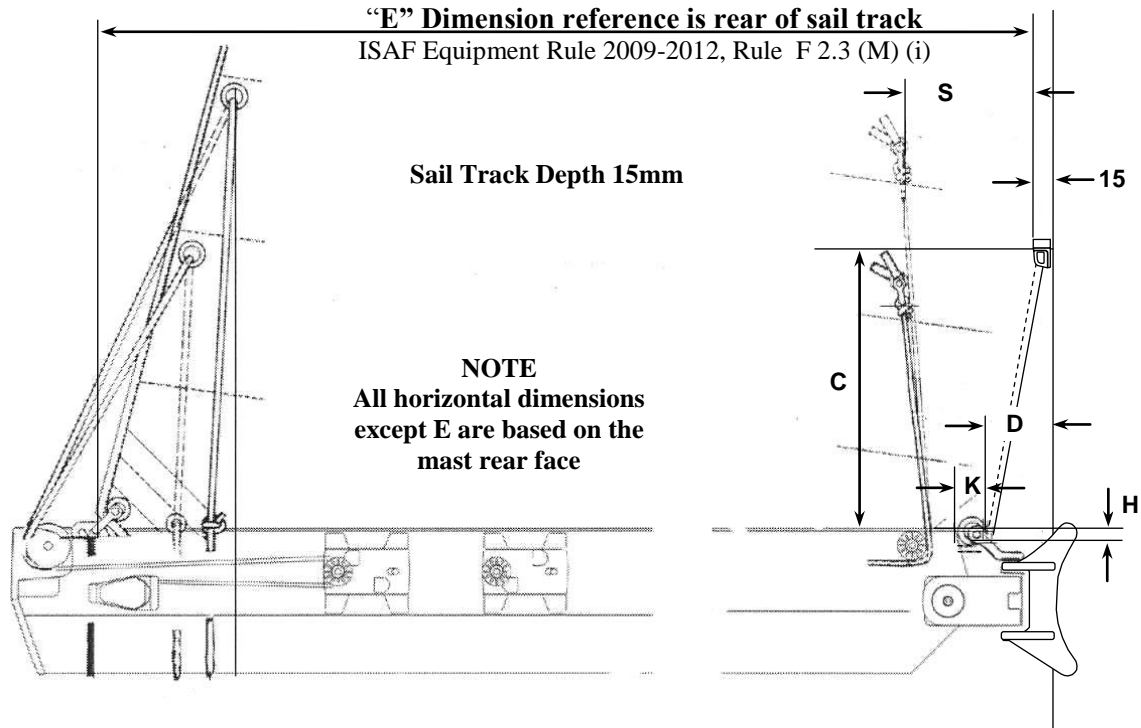


Mast Section	Boom Profile	Boom Section	Sail foot groove	Sail feeder “cut back”			Tack		Reef hooks
				C RCB Track	C (Bolt rope)	K	D	H *	F
CC154 – CC244		B190	5.8± 0.75	150	725	35	80	-5	80
CC154 – CC244		B230	6.25± 0.75	150	725	45	80	-25	80
CC263 – CC284		B230	6.25± 0.75	150	725	35	100	-25	80

* Tack hooks are below top of boom extrusion

For detail of aluminium boom functions and clew arrangements, see the main Seldén Sailmakers Guide 595-542-E

4.2.2 Aluminium Match Single Line Reef Boom on Carbon Mast

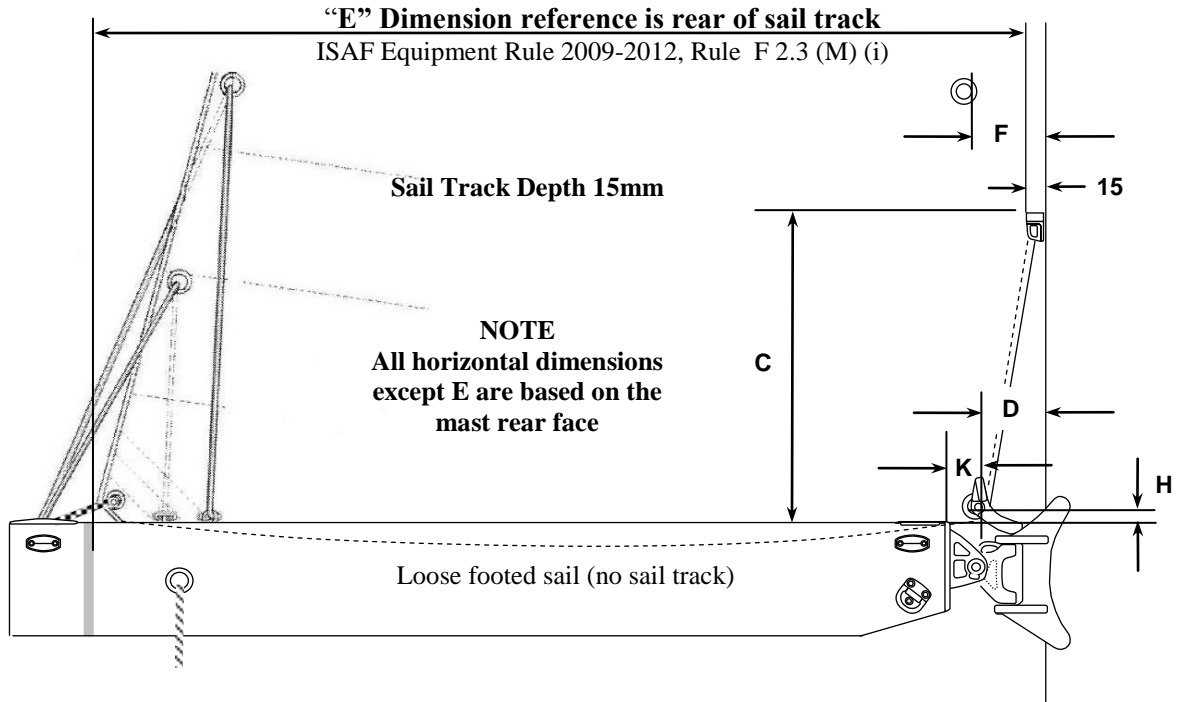


Mast Section	Boom Profile	Boom Section	Sail foot groove	Sail feeder “cut back”			Tack		Single line reef		
				C (RCB Track)	C (Bolt rope)	K	D	H*	S	Max Ht. Reef 1 (Port)	Max Ht. Reef 2 (Stbd)
CC154 – CC244		B190	5.8±0.75	150	725	35	80	-5	180	E-1650	E-470
CC154 – CC244		B230	6.25±0.75	150	725	45	80	-25	195	E-1900	E-650

* Tack shackle below top of extrusion

For detail of aluminium boom functions and clew arrangements, see the main Seldén Sailmakers Guide 595-542-E

4.3.1 Carbon Slab Reef Boom on Carbon Mast



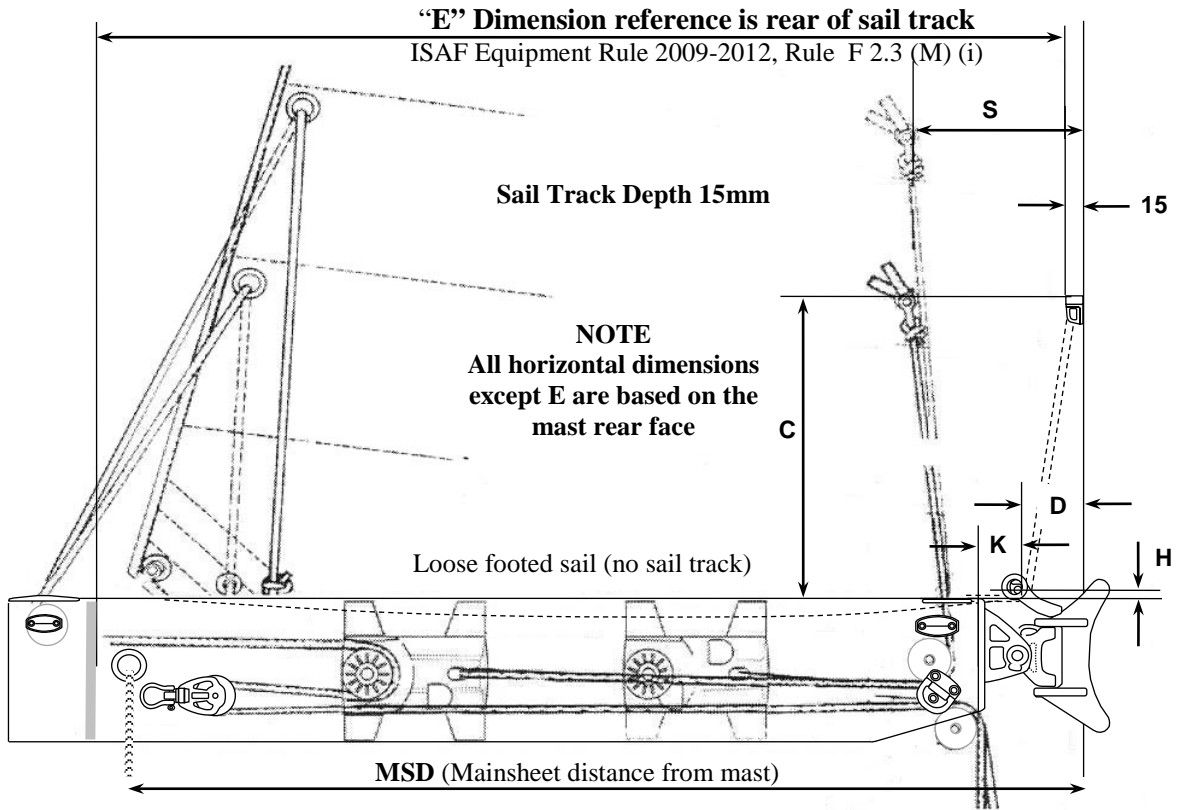
Mast Section	Boom Profile (no track)	Boom Section	Sail feeder "cut back"			Tack		Reef hooks
			C 1) RCB Track	C 1) Bolt rope	K	D	H	F
CC079 – CC138		BC086	–	600	55	55	0	70
CC115 – CC138		BC115	325 2)		15	60	20	75
		BC138	185 3)		45	70	10	75
CC154 – CC192		BC115	155	725	20	80	30	80
		BC138			50	80	25	80
		BC154			50	80	15	80
BC174		50			80	15	80	
CC210 – CC244		BC115			20	85	30	85
		BC138			50	85	25	85
		BC154			50	85	15	85
		BC174			50	85	15	85
CC210 – CC226		BC192	65	85	15	85		
CC244		BC192	60	100	10	110		
CC263 – CC303		BC174	55	100	40	110		
		BC192	60	100	10	110		
		BC244	60	100	10	110		
	BC303	60	100	10	110			

Note

- 1) Measurements are for Seldén RCB track. CC284 & CC303 have Antal track as standard.
- 2) Ronstan 14 track system. Base of main track (above removable feeder)
- 3) Harken AA track system. Base of main track (above removable feeder)

4.3.2 Carbon Single Line Reef (Selden Type) Boom on Carbon Mast

Note this applies to BC244 and above

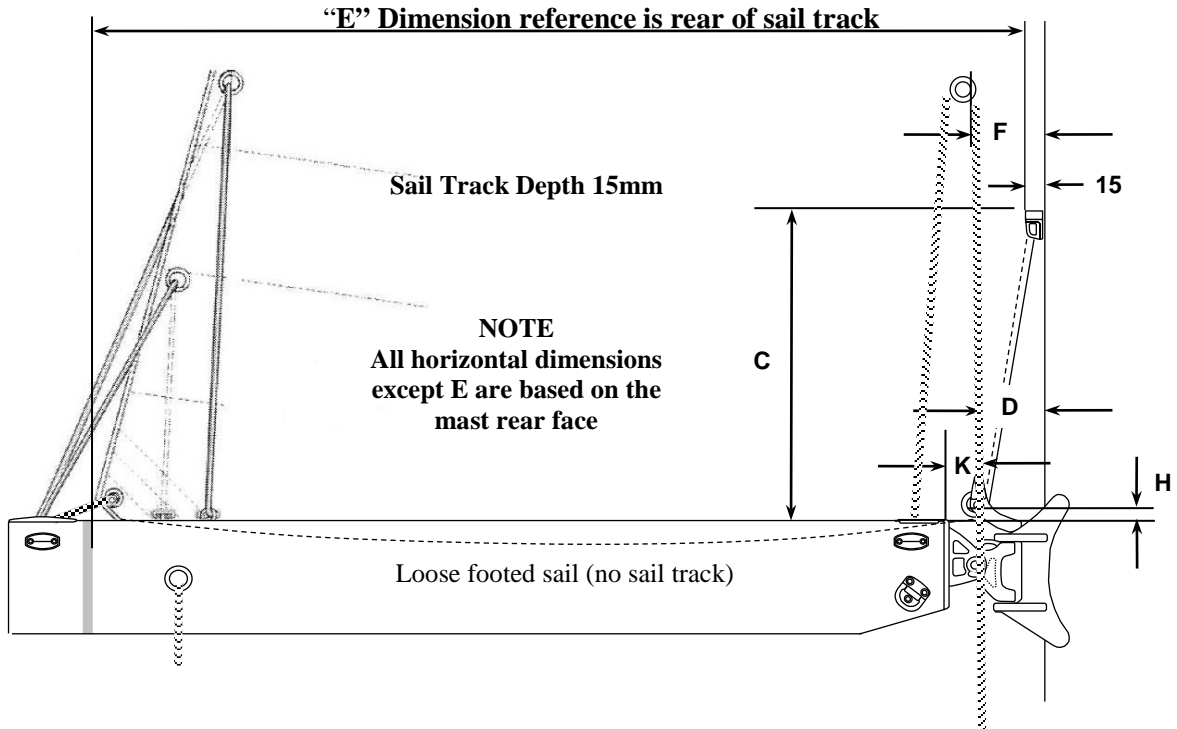


Mast Section	Boom Profile (no track)	Boom Section	Sail feeder "cut back"		Tack			SL Reef		
			C RCB Track (mm)	C Bolt Rope (mm)	K (mm)	D (mm)	H (mm)	S (mm)	Max Height Reef 1 (Stbd)	Max Height Reef 2 (Port)
CC115 – CC138		BC115	155	725	20	70	20	120		
		BC138			60	70	10	170	MSD-1900	MSD-890
CC154 – CC192		BC115			20	80	30	145		
		BC138			55	80	25	180	MSD-1900	MSD-890
		BC154			60	80	15	185	MSD-1900	MSD-930
CC210 – CC244		BC174			50	80	15	200	MSD-1900	MSD-920
		BC115			20	85	30	150		
		BC138			55	85	25	185	MSD-1900	MSD-890
CC210 – CC226		BC154			60	85	15	190	MSD-1900	MSD-930
		BC174			50	85	15	205	MSD-1900	MSD-920
CC244		BC192			65	85	15	265	MSD-2000	MSD-980
CC263 – CC303		BC192			65	100	10	280	MSD-2000	MSD-980
	BC174	60	100	40	270	MSD-1900	MSD-920			
	BC192	65	100	10	240	MSD-2000	MSD-980			
	BC244	65	100	10	290	MSD-2100	MSD-1020			
	BC303	65	100	10	305	MSD-2100	MSD-1060			

Notes:

1. For additional information regarding reef attachments, additional reefs, tack hooks and clews, RCB track & cars, use the main Seldén Sailmaker's guide.
2. Maximum heights of Single line reefs depend on dimension MSD. This determines the internal car's maximum aft travel before it reaches the mainsheet cross tube.

4.3.3 Carbon (Simple SLR) Boom on Carbon Mast

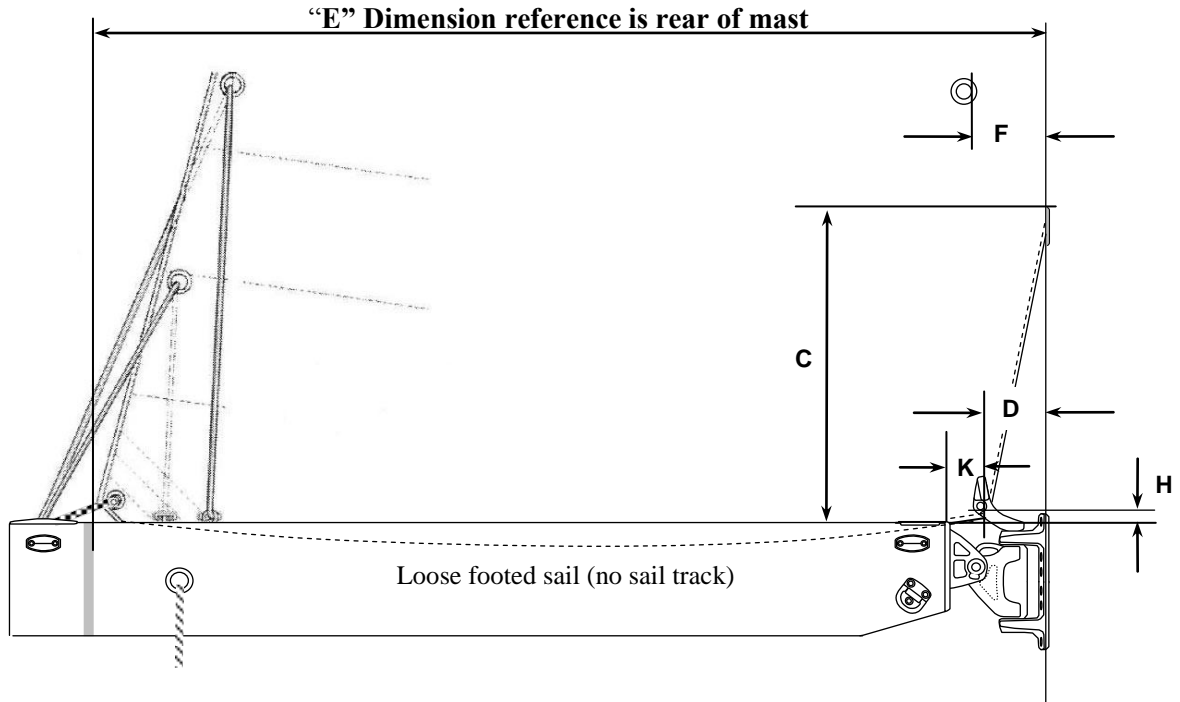


Mast Section	Boom Profile (no track)	Boom Section	Sail feeder "cut back"		Tack			
			C RCB Track (mm)	C Bolt Rope (mm)	K (mm)	D (mm)	H (mm)	F (mm)
CC115 – CC138		BC115	155	725	20	70	20	120
		BC138			60	70	10	170
CC154 – CC192		BC115			20	80	30	145
		BC138			55	80	25	180
		BC154			60	80	15	185
CC210 – CC244		BC174			50	80	15	200
		BC115			20	85	30	150
		BC138			55	85	25	185
		BC154			60	85	15	190
CC210 – CC226		BC174			50	85	15	205
		BC192			65	85	15	265
CC244		BC192			65	100	10	280
CC263 – CC303	BC174	60	100	40	270			
	BC192	65	100	10	240			
	BC244	65	100	10	290			
	BC303	65	100	10	305			

Notes:

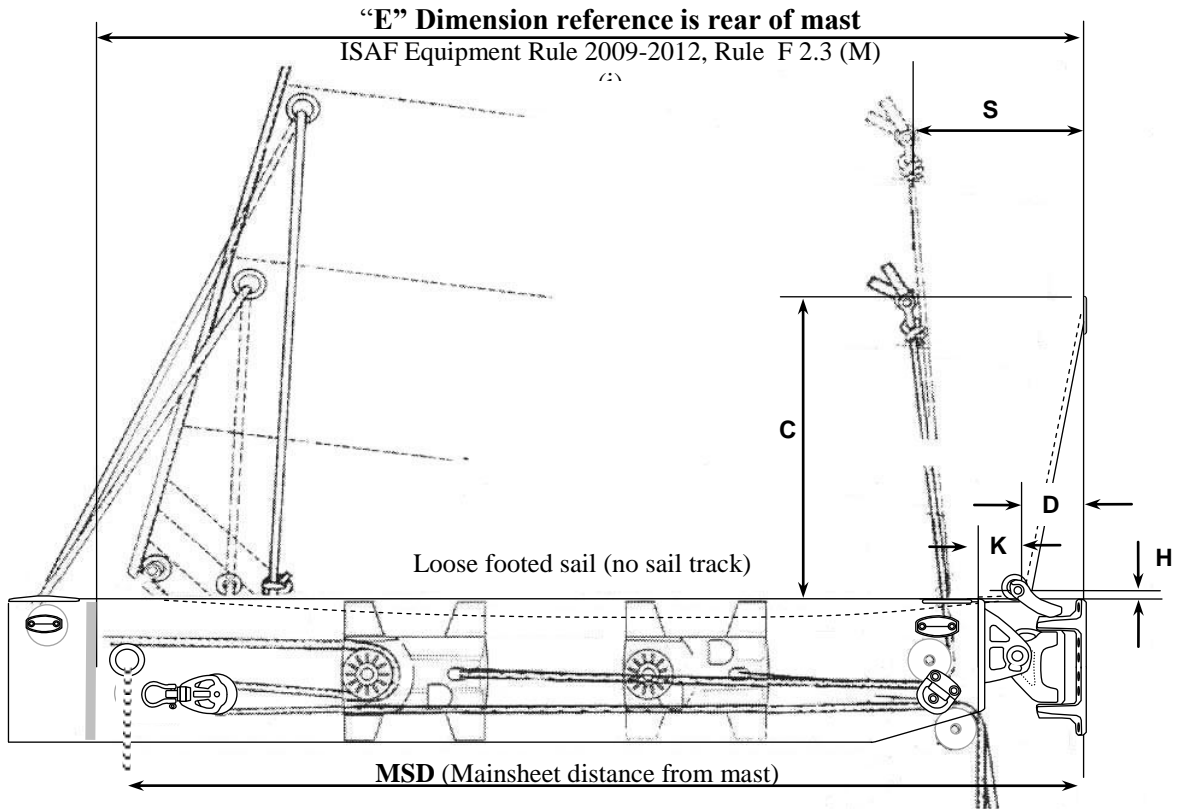
1. For additional information regarding reef attachments, additional reefs, tack hooks and clews, RCB track & cars, use the main Seldén Sailmaker's guide.
2. This Simple SLR system has no limitation on reef depth, it is truly single line with no internal cars. A block or ring may be used on the reef attachment on the luff of the sail.

4.4.1 Carbon Slab Reef Boom on Aluminium Mast



Mast Section	Boom Profile (no groove)	Boom Section	Sail feeder "cut back"			Tack		Reef hooks
			C MDS Slides	C Bolt rope	K	D	H	F
C080 – C139		BC086	–	600	15	55	0	70
		BC115	–		25	55	0	70
C116 – C139		BC115	–		10	70	25	75
		BC138	–	65	70	10	75	
C156 – CC245		BC115	130	750	15	80	45	80
		BC138	130		35	80	30	80
		BC154	120		35	80	20	80
		BC174	110		25	80	20	80
		BC192	170		40	100	15	80
C264 – C304		BC174	180	750	20	100	45	110
	BC192	150	60		100	15	110	
	BC244	150	50		100	15	110	
C264 – C304	BC303	170	60		100	40	110	

4.4.2 Carbon Single Line Reef Boom on Aluminium Mast

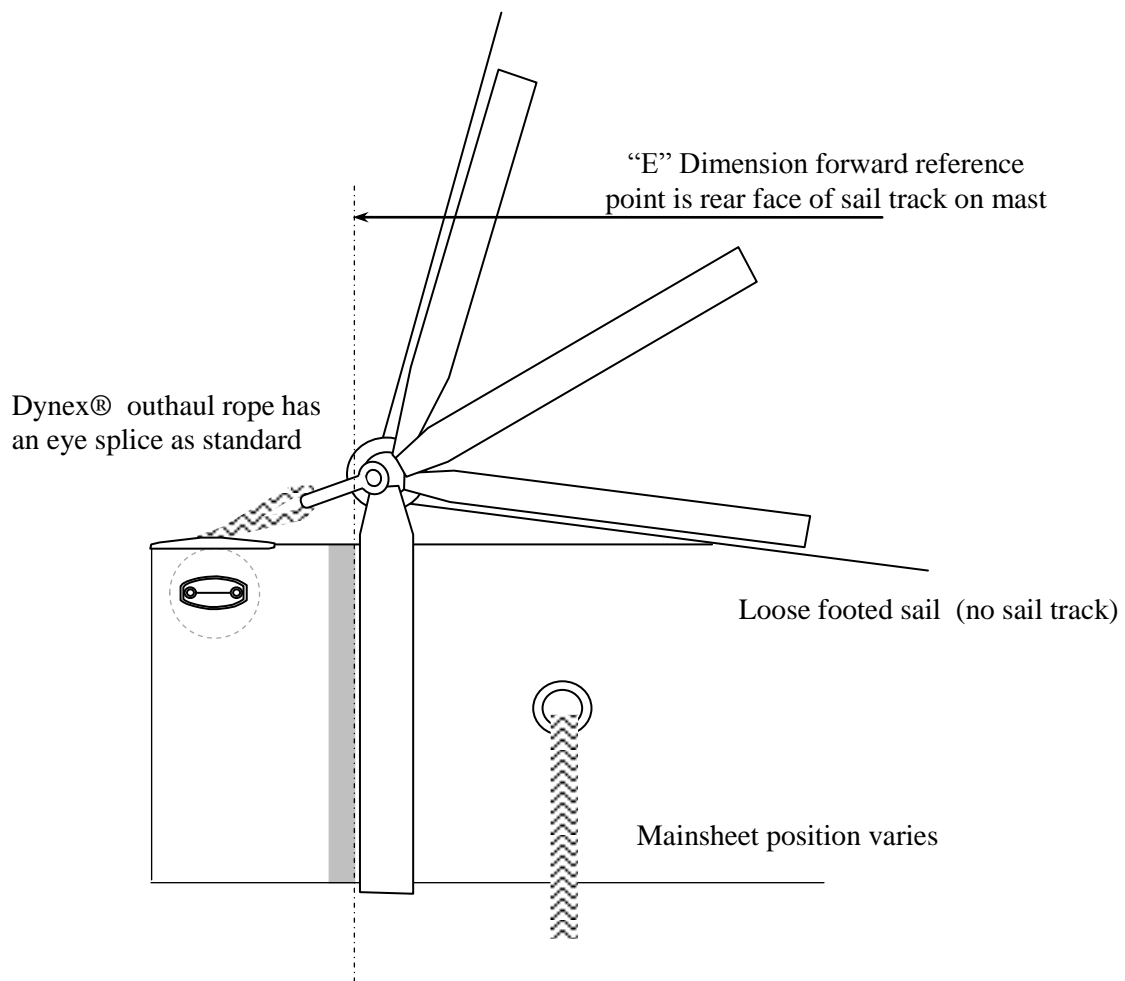


Mast Section	Boom Profile (no track)	Boom Section	Sail feeder “cut back”		Tack			SL Reef		
			C MDS Slides (mm)	C Bolt Rope (mm)	K (mm)	D (mm)	H (mm)	S (mm)	Max Height Reef 1 (Stbd)	Max Height Reef 2 (Port)
C080 – C106		BC115	–	600	25	55	0	120	tba	tba
C116 – C139		BC115	–		10	70	25	120	tba	tba
		BC138	–		65	70	10	170	MSD-1900	MSD-890
C156 – C245		BC115	130	750	15	80	35	145	tba	tba
		BC138	130		35	80	30	180	MSD-1900	MSD-890
		BC154	120		35	80	20	185	MSD-1900	MSD-930
		BC174	110		25	80	15	200	MSD-1900	MSD-920
BC192		170	65		100	15	265	MSD-2000	MSD-980	
C263 – C304		BC174	180		60	100	45	270	MSD-1900	MSD-920
		BC192	150		65	100	15	240	MSD-2000	MSD-980
	BC244	150	65	100	15	290	MSD-2100	MSD-1020		
	BC303		65	100	10	305	MSD-2100	MSD-1060		

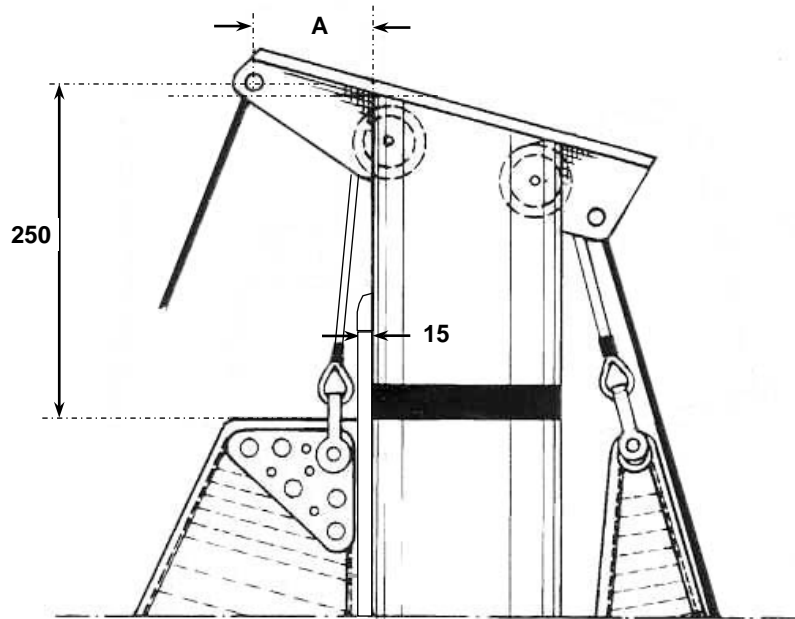
Notes:

1. For additional information regarding reef attachments, additional reefs, tack hooks and clews, RCB track & cars, use the main Seldén Sailmaker’s guide.
2. Maximum heights of Single line reefs depend on dimension MSD. This determines the internal car’s maximum aft travel before it reaches the mainsheet cross tube

5 Carbon Boom Clew Outhaul Arrangement

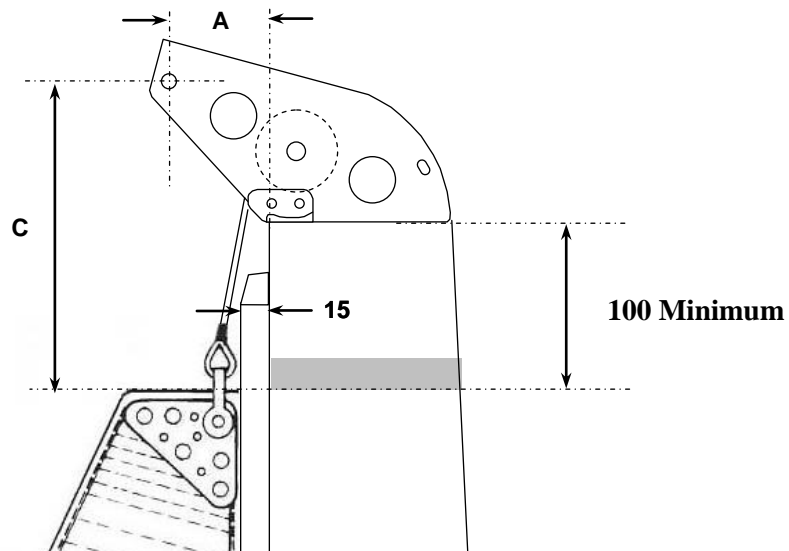


6.1 Carbon Yacht Head Dimensions



Section	Distance aft side of mast - backstay fixing point
CC154	160
CC174	
CC192	
CC210	190
CC226	
CC224	178
CC263	184
CC303	

6.2 Carbon Keelboat Head Dimensions



Dimensions A & C (mm)						
Mast Section	Fractional Rig					
	Standard Crane		Long Crane		Long Crane + MH spin	
	A	C	A	C	A	C
CC077						
CC086	59	165	150	190	100	175
CC095	53	165	144	190	94	175
CC105	70	170	180	200	105	180
CC115	63	170	173	200	99	180
CC125	83	185	212	220	127	200
CC138	74	185	203	220	118	200