



BRIDLE LINE & SPEED SYSTEM MAINTENANCE



BRIDLE LINE LENGTHS ALL MEASUREMENTS IN MM

Exposure to heavy loads, regular wear and tear, as well as harsh marine environments such as water, salt, sand, and sun, can lead to stretching, shrinking, or damage in both Bridle lines and Speed System lines.

Bridle lines and Speed Systems require maintenance just like any high performance equipment in racing sports - they must be checked regularly and maintained in the correct trim or the kite will not perform as designed. Check all lines to their specs and replace if necessary.

CHECKING INDIVIDUAL BRIDLE LINES

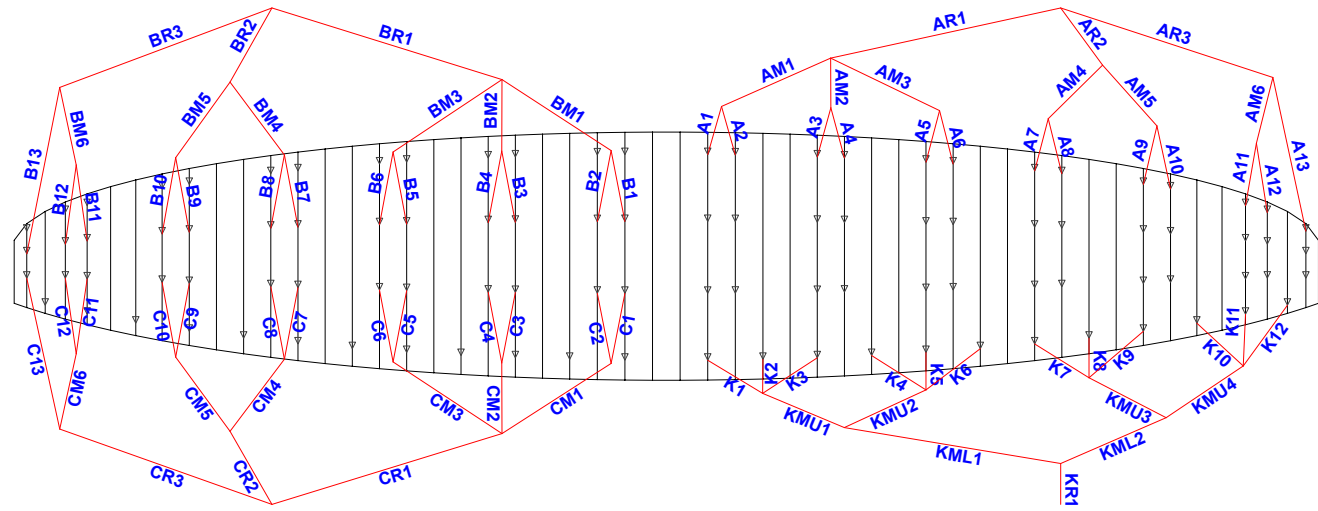
Bridle Lines that are worn or not to factory specification (+ or - 15mm) must be replaced. Replacement lines can be ordered individually or as a full set from your shop/dealer. The kite repair pack includes spare bridle line lengths that can be used to make a short-term replacement bridle line.

1. Open the kite out in a large space.
2. Inspect all bridle lines for wear/damage. Take note or label lines to be replaced.
3. Use a measuring device to measure the remaining bridles. Ask an assistant to hold the measuring device and bridle line in position to get an accurate measurement.
4. Pull on the line with 5kg of load and note each measurement.
5. Refer to the bridle line measurements and rigging diagrams. Take note or label lines to be replaced.
6. Replace all bridle lines as necessary.

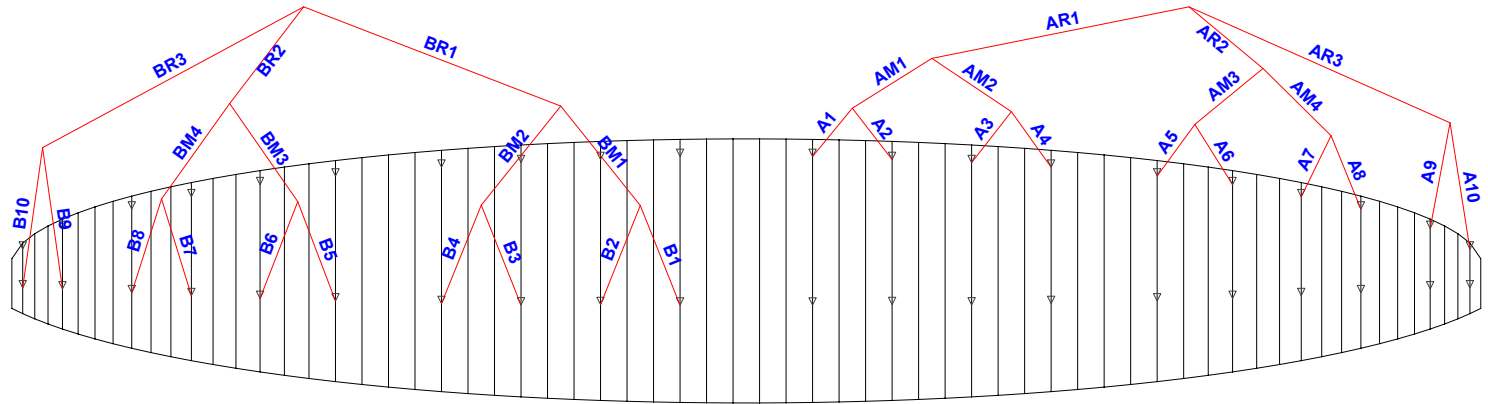
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A1	8001-050	338	358	8001-050	1069	1118	1223	1236	8001-050	1621	1685	C2	8001-025	298	317
A2	8001-050	275	292	8001-050	926	970	1067	1066	8001-050	1380	1434	C3	8001-025	322	343
A3	8001-050	299	318	8001-050	989	1037	1133	1133	8001-050	1466	1513	C4	8001-025	272	290
A4	8001-050	249	265	8001-050	895	940	1030	1032	8001-050	1326	1372	C5	8001-025	243	265
A5	8001-050	220	241	8001-025	845	891	1004	1059	8001-025	928	953	C6	8001-025	209	231
A6	8001-050	187	207	8001-025	668	706	800	850	8001-025	724	743	C7	8001-025	264	294
A7	8001-025	241	269	8001-025	602	639	761	805	8001-025	734	74	C8	8001-025	183	208
A8	8001-025	159	183	8001-025	506	539	653	692	8001-025	635	644	C9	8001-025	171	196
A9	8001-025	149	173	8001-025	881	933	1015	1086	8001-025	146	187	C10	8001-025	124	146
A10	8001-025	105	126	8001-025	766	814	884	961	8001-025	115	153	C11	8001-025	245	274
A11	8001-025	225	253									C12	8001-025	180	206
A12	8001-025	163	188									CM1	8001-050	1900	2010
A13	8001-050	766	826									CM2	8001-050	1700	1800
AM1	8001-090	1900	2010	8001-090	1624	1700	1900	2000	8001-090	2200	2300	CM3	8001-050	1600	1690
AM2	8001-090	1700	1800	8001-090	1433	1500	1700	1800	8001-090	1900	2000	CM4	8001-050	1100	1160
AM3	8001-090	1600	1690	8001-050	1242	1300	1450	1500	8001-050	1600	1700	CM5	8001-050	900	950
AM4	8001-050	1100	1160	8001-050	1146	1200	1290	1340	8001-050	1400	1500	CM6	8001-050	700	740
AM5	8001-050	900	950									CR1	8001-070	2610	2765
AM6	8001-070	700	740									CR2	8001-070	2810	2975
AR1	8001-190	2600	2750	8001-190	2865	3000	3400	3500	8001-190	3186	3385	CR3	8001-070	2610	2765
AR2	8001-130	2800	2960	8001-090	2865	3000	3400	3500	8001-090	3500	3700	K1	8001-025	814	858
AR3	8001-070	2600	2750	8001-070	3343	3500	4000	4100	8001-070	5100	5350	K2	8001-025	609	642
B1	8001-025	303	321	8001-025	1070	1119	1238	1256	8001-025	1598	1661	K3	8001-025	483	511
B2	8001-025	240	255	8001-025	928	972	1087	1091	8001-025	1348	1401	K4	8001-025	651	692
B3	8001-025	265	282	8001-025	1000	1049	1143	1146	8001-025	1436	1481	K5	8001-025	495	529
B4	8001-025	216	231	8001-025	907	953	1041	1056	8001-025	1327	1373	K6	8001-025	462	495
B5	8001-025	190	210	8001-025	871	918	1025	1092	8001-025	976	1004	K7	8001-025	586	631
B6	8001-025	159	178	8001-025	695	735	825	884	8001-025	772	793	K8	8001-025	397	433
B7	8001-025	216	242	8001-025	629	668	800	840	8001-025	780	792	K9	8001-025	347	379
B8	8001-025	159	159	8001-025	531	566	689	725	8001-025	672	682	K10	8001-025	408	444
B9	8001-025	132	154	8001-025	918	972	1050	1132	8001-025	183	226	K11	8001-025	311	344
B10	8001-025	91	110	8001-025	796	845	884	988	8001-025	143	183	K12	8001-025	364	397
B11	8001-025	217	244									KML1	8001-050	1400	1480
B12	8001-025	157	181									KML2	8001-050	1100	1160
BM1	8001-050	1900	2010	8001-050	1624	1700	1870	1970	8001-050	2200	2300	KMU1	8001-050	1300	1380
BM2	8001-050	1700	1800	8001-050	1433	1500	1700	1800	8001-050	1900	2000	KMU2	8001-050	1000	1060
BM3	8001-050	1600	1690	8001-050	3343	1300	1450	1500	8001-050	1600	1700	KMU3	8001-050	1000	1060
BM4	8001-050	1100	1160	8001-050	1146	1200	1300	1350	8001-050	1400	1500	KMU4	8001-050	800	850
BM5	8001-050	900	950									KRI	8001-090	2520	2665
BM6	8001-050	700	740												
BR1	8001-070	2600	2750	8001-070	2865	3000	3400	3500	8001-070	3200	3400				
BR2	8001-070	2800	2960	8001-070	2865	3000	3400	3500	8001-070	3500	3700				
BR3	8001-070	2600	2750	8001-050	3343	3500	4000	4100	8001-050	5100	5350				
BM1	8001-050	1900	2010	8001-050	1624	1700	1870	1970	8001-050	2200	2300				
BM2	8001-050	1700	1800	8001-050	1433	1500	1700	1800	8001-050	1900	2000				
BM3	8001-050	1600	1690	8001-050	3343	1300	1450	1500	8001-050	1600	1700				
BM4	8001-050	1100	1160	8001-050	1146	1200	1300	1350	8001-050	1400	1500				
BM5	8001-050	900	950												
BM6	8001-050	700	740												
BR1	8001-070	2600	2750	8001-070	2865	3000	3400	3500	8001-070	3200	3400				
BR2	8001-070	2800	2960	8001-070	2865	3000	3400	3500	8001-070	3500	3700				
BR3	8001-070	2600	2750	8001-050	3343	3500	4000	4100	8001-050	5100	5350				



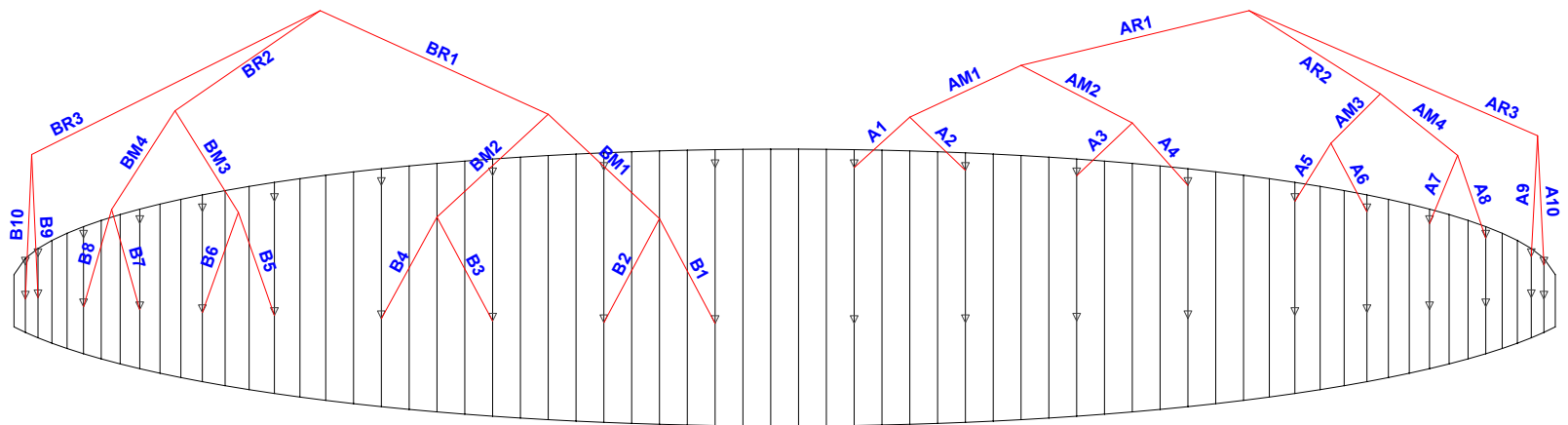
8M/9M
RIGGING DIAGRAM



10M/11M /14M/15M
RIGGING DIAGRAM



19M/21M
RIGGING DIAGRAM

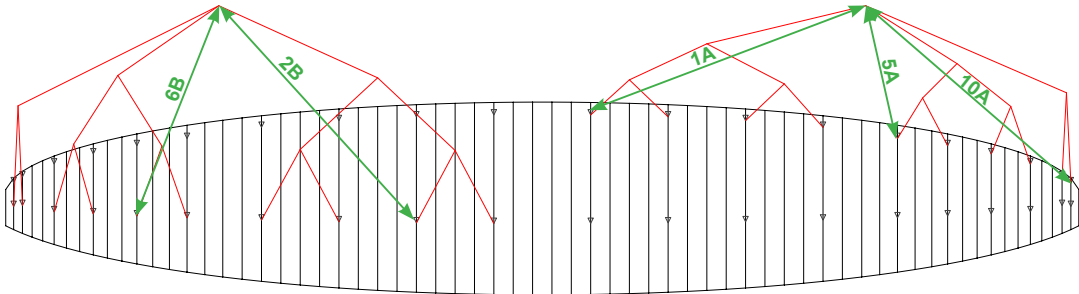




CHECKING OVERALL BRIDLE LENGTHS

Checking the overall length of bridle lines is another step to ensure the kite is trimmed correctly. Overall bridle lengths should not exceed + or - 20mm.

1. Open the kite out in a large space.
2. Use a measuring device to measure from the top of the Speed System to the bridle line attachment tab on the kite.
3. Ask an assistant to hold the measuring device and Speed System (or attachment tab) to get an accurate measurement.
4. Pull on the bridle with 5kg of load and note each measurement.
5. Refer to the overall bridle line measurements and diagram. Take note or label lines to be replaced.
6. Replace all bridle lines as necessary.
7. It is also possible to shorten a riser bridle line. Refer to the next section.



8m	A	B	C	K	9m	A	B	C	K
1	4838	4803	4872	6029	1	5118	5081	5159	6378
2	4775	4740	4809	5824	2	5052	5015	5093	6162
3	4599	4565	4633	5698	3	4868	4832	4909	6031
4	4549	4516	4583	5566	4	4815	4781	4856	5892
5	4420	4390	4454	5410	5	4681	4650	4721	5729
6	4387	4359	4420	5377	6	4647	4618	4687	5695
7	4141	4117	4175	5201	7	4389	4363	4430	5511
8	4059	4038	4094	5012	8	4303	4280	4344	5313
9	3849	3833	3882	4962	9	4083	4065	4122	5259
10	3805	3792	3835	4823	10	4036	4021	4072	5114
11	3525	3518	3556	4726	11	3743	3735	3780	5014
12	3463	3458	3491	4779	12	3678	3672	3712	5067
13	3361	3355	3376		13	3571	3565	3592	

10m	A	B	11m	A	B	14m	A	B
1	5556	5559	1	5816	5819	1	6521	6508
2	5413	5417	2	5668	5672	2	6365	6357
3	5290	5298	3	5540	5549	3	6236	6243
4	5196	5205	4	5443	5453	4	6133	6141
5	4955	4978	5	5194	5218	5	5857	5875
6	4778	4802	6	5009	5035	6	5653	5675
7	4616	4640	7	4842	4868	7	5454	5500
8	4520	4542	8	4742	4766	8	5346	5389
9	4229	4261	9	4438	4472	9	5020	5050
10	4109	4139	10	4314	4345	10	4884	4910

15m	A	B	19m	A	B	21m	A	B
1	6734	6726	1	7005	6998	1	7368	7361
2	6564	6561	2	6764	6748	2	7117	7101
3	6436	6446	3	6555	6536	3	6901	6881
4	6335	6356	4	6415	6427	4	6760	6773
5	6062	6092	5	6031	6076	5	6356	6404
6	5853	5884	6	5827	5872	6	6146	6193
7	5648	5690	7	5637	5680	7	5947	5992
8	5535	5575	8	5538	5572	8	5847	5882
9	5191	5232	9	5250	5283	9	5542	5576
10	5061	5088	10	5210	5240	10	5503	5533

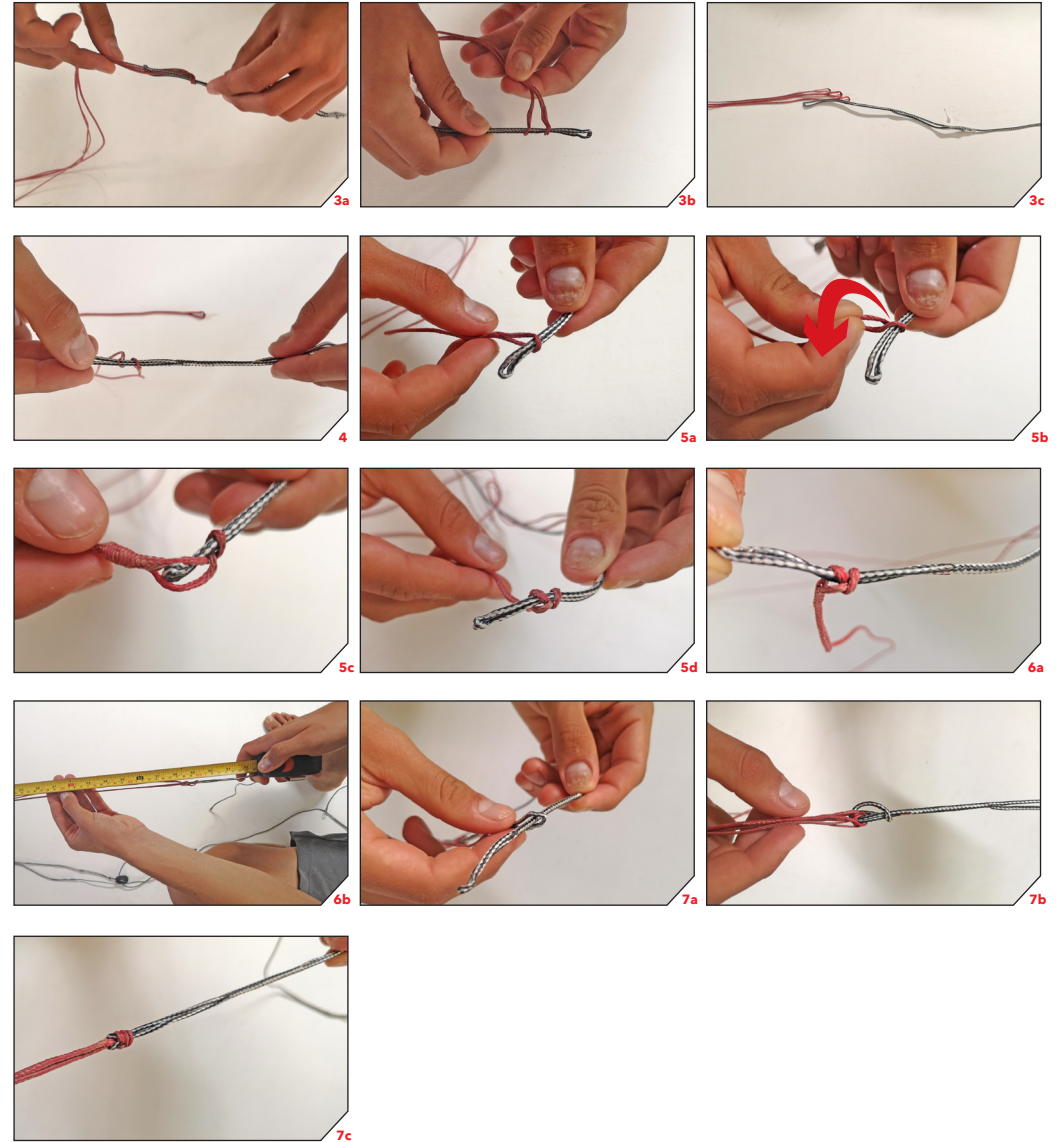


SHORTENING A RISER BRIDLE LINE USING THE ADDITIONAL LOOP TECHNIQUE

If a riser bridle line (AR1/2/3, BR1/2/3, CR1/2/3) has stretched it is possible to shorten by making one or two additional loops in the connection to the Speed System upper lines (4-line system: PA2/PB3/PC1, 2-line system: PA1/PA2).

If the riser bridle line is stretched more than it is possible to compensate with one or two additional loops, we recommend to replace or re-splice to the spec length.

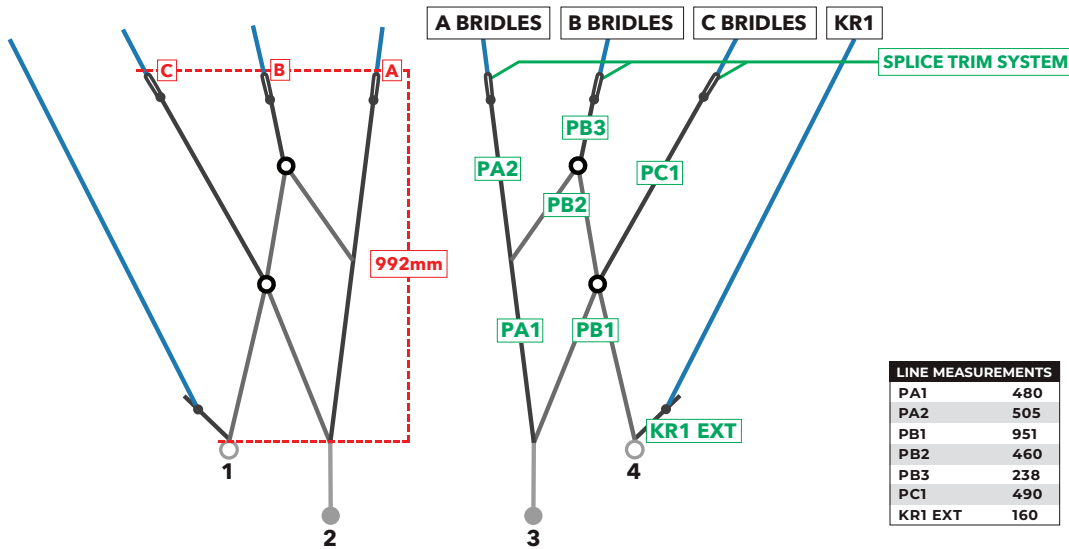
1. Lay out the Speed System and bridles as you would for set up.
2. Disassemble the Speed System to separately access the bridle line groups - refer to the Speed System Pulley Line Replacement sections for how to take the Speed System apart.
3. Open the loop to loop connection between Speed System upper line and riser bridle lines.
4. Put the riser bridle lines that are not affected in length back onto the Speed System upper line.
5. Put the affected riser bridle line onto the Speed System upper line using a double loop as shown. This will shorten the line length by around 1cm to 1.5cm depending on the line thickness. If the affected line needs shortening even more, add a second loop.
6. Tighten onto the Speed System upper line and re-measure to check if the modification has brought it back within tolerance.
7. Close the loop to loop connection by feeding the Speed System line's lower end through its upper loop (i.e. reverse way from opening).
8. Reassemble the Speed System.
9. Repeat for the other side and/or other affected riser bridle lines.





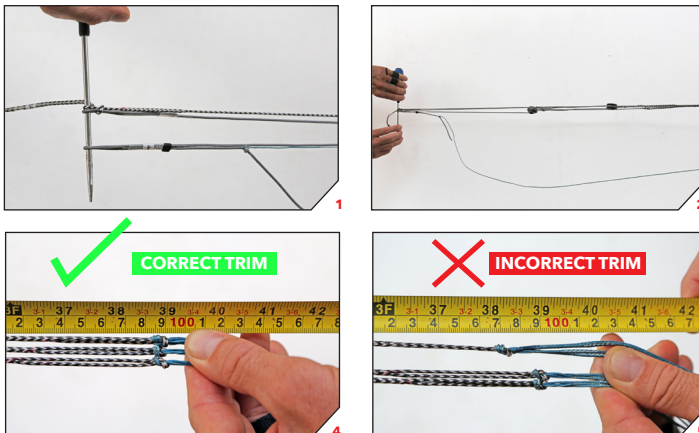
R1 V5 4-LINE SPEED SYSTEM MAINTENANCE

R1 V5 4-Line Speed System lines that are worn must be replaced. If the Speed System lines are not worn but are not to factory specifications you must adjust back to factory spec using the Splice Trim System.



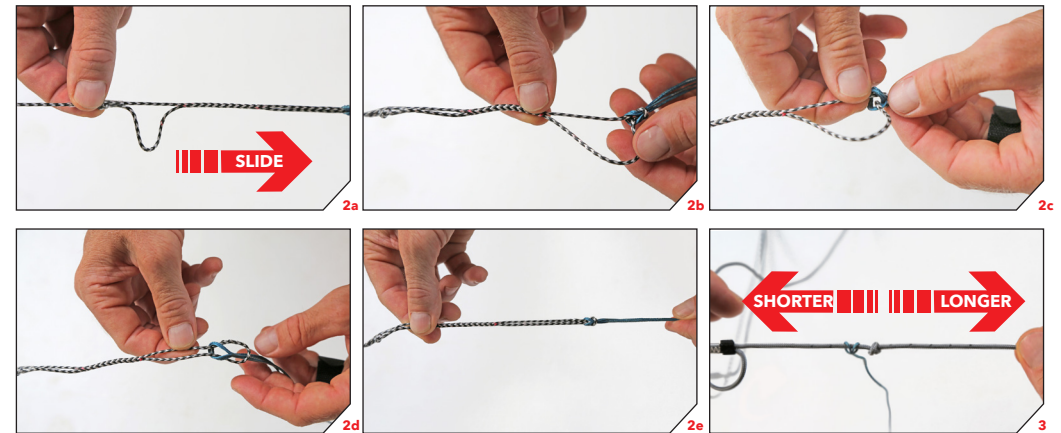
MEASUREMENT

- Align the lower ends of PA1 and PB1.
- Ask an assistant to hold lower ends even, or use a ground stake (or a screw driver) through the lower end loops.
- Apply even tension through the Speed System by pulling on the A, B and C bridle line groups attached to the upper ends of PA2, PB3 and PC1 respectively.
- The overall length of the Speed System should measure 992mm from the lower ends to the upper ends.
- If measurement points A, B and/or C are not positioned at 992mm they can be individually adjusted using the Splice Trim System located on lines PA2, PB3 and PC1.
- Check all Speed System lines to their specs and replace as necessary.



ADJUSTMENT

- To shorten: pull the knot under the heat shrink down twice the distance required to adjust. While holding it in position, loosen the splice so the loop can adjust to its new length. Loosen the bridle lines connection at the upper end of PA2/PB3/PC1 and move them to position at the top of the loop. Pull the lines tight and ensure the splice is locking.
- To lengthen: push the knot under the heat shrink up twice the distance required to adjust. The upper end of the knot is spliced into itself. Loosen the splice and pull out line as required from the top end of the splice. Loosen the bridle lines connection at the upper end of PA2/PB3/PC1 and move them to position at the top of the loop. Pull the lines tight and ensure the splice is locking.
- If adjusting the position of measurement C by changing the length of PC1, the position of the knot in KR1 EXT must also be adjusted by the same amount and in the same direction.
- If A, B and/or C can not be adjusted to a length of 992mm the Speed System lines have likely shrunk or stretched and/or might be damaged.
- Check all Speed System lines to their specs and replace as necessary.



EXAMPLE 1: If measurement point A is 20mm longer than the factory standard spec of 992mm, move the knot under the heat shrink down 40mm and adjust the A bridles connection to the loop of PA2.

EXAMPLE 2: If measurement point B is 10mm shorter than the factory standard spec of 992mm, move the knot under the heat shrink up 20mm and adjust the B bridles connection to the loop of PB3.

EXAMPLE 3: If measurement point C is 10mm shorter than the factory standard spec of 992mm, move the knot under the heat shrink up 20mm and adjust the C bridles connection to the loop of PC1. Then move the knot in KR1 EXT up by 10mm.

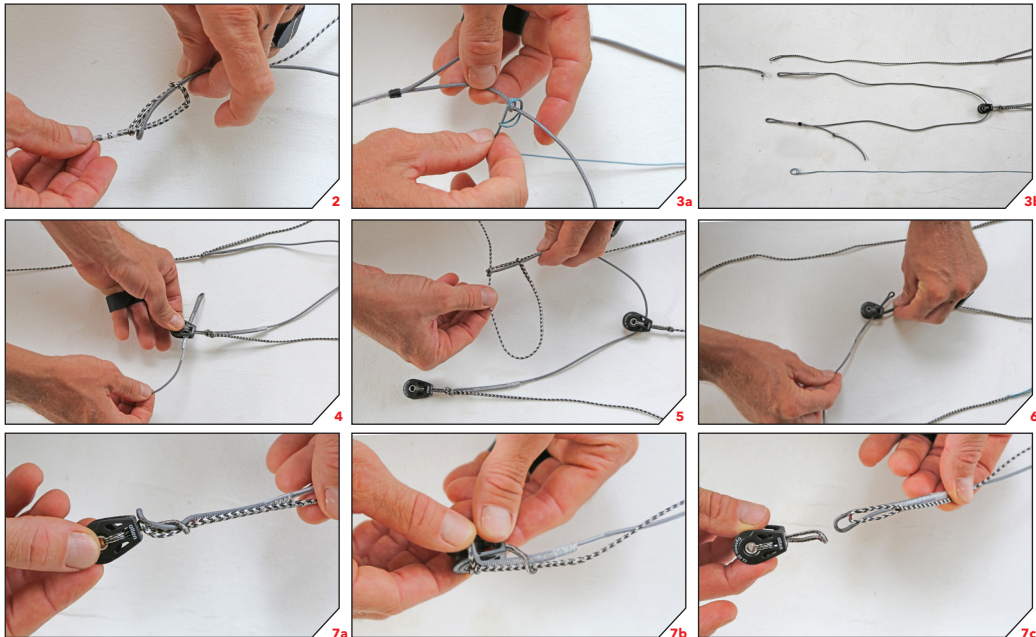
EXAMPLE 4: If measurement point C is 20mm longer than the factory standard spec of 992mm, move the knot under the heat shrink down 40mm and adjust the C bridles connection to the loop of PC1. Then move the knot in KR1 EXT down by 20mm.



PULLEY LINE REPLACEMENT

The sheathed pulley lines (PB1 & PB2) will likely wear the fastest. Check them before every session. Spare pulley lines are supplied in the kites repair kit.

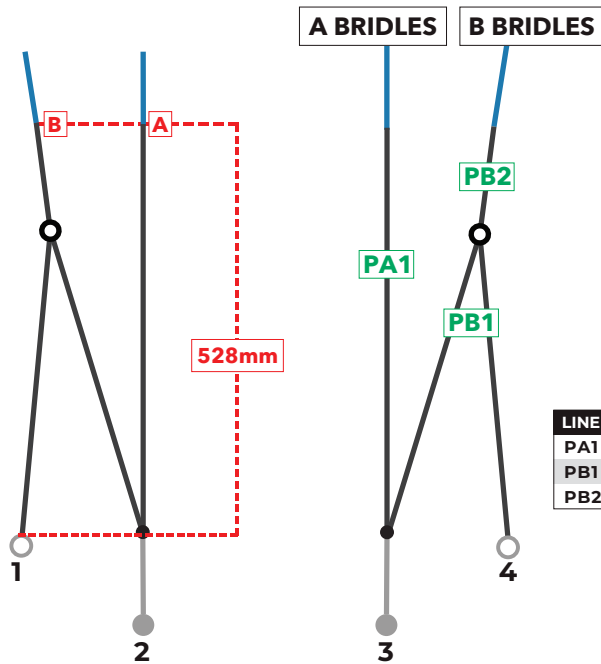
1. Disconnect the flying lines and lay the Speed System out in an open area.
2. Disconnect the front pigtail (#2 or #3).
3. Disconnect KR1 from KR1 EXT.
4. Remove PB1 from the lower pulley.
5. Disconnect PA1 from PA2 and PB2.
6. Remove PB2 from the upper pulley.
7. Disconnect PB2 and PC1 from the pulley - loosen the loop-to-loop connection and feed the pulley through the end loops of PB2 and PC1.
8. Take the replacement PB2 and reverse the previous steps to re-assemble the Speed System.
9. Connect replacement PB2 and PC1 to the pulley with a loop-to-loop connection.
10. Feed the replacement PB2 through the upper pulley.
11. Connect replacement PB2 and PA2 with PA1.
12. Take replacement PB1 and feed it through the lower pulley.
13. Connect PB1 and PA1 to the front line pigtail (#2 or #3).
14. Connect KR1 to KR1 EXT.
15. Repeat the same process for the other speed system side. Always check your speed system and replace lines when excessive wear shows.





R1 V5 2-LINE SPEED SYSTEM MAINTENANCE

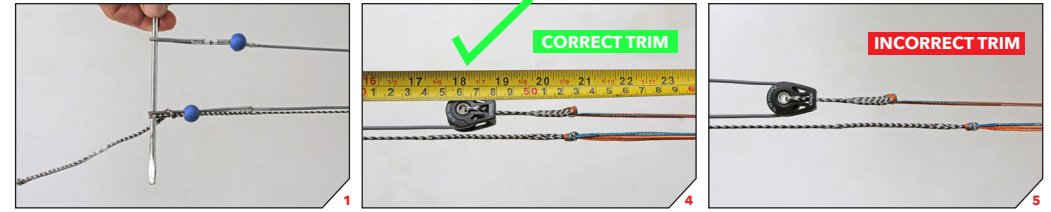
R1 V5 2-Line Speed System lines that are worn or are not to factory specifications must be replaced. There is no adjustment on the 2-Line Speed System.



LINE MEASUREMENTS	
PA1	528
PB1	950
PB2	50

MEASUREMENT

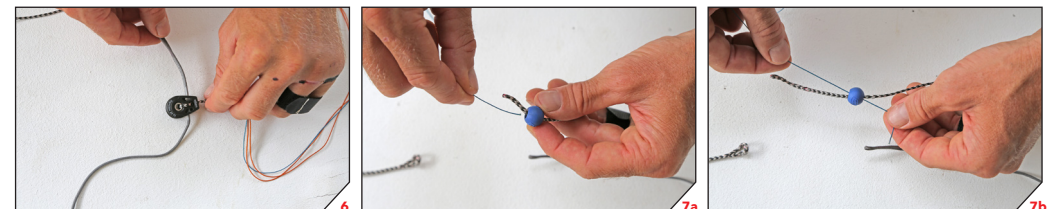
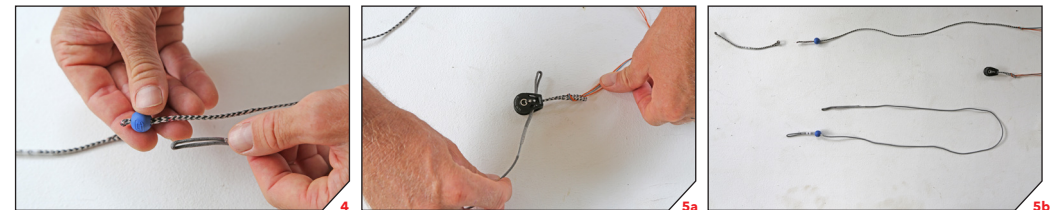
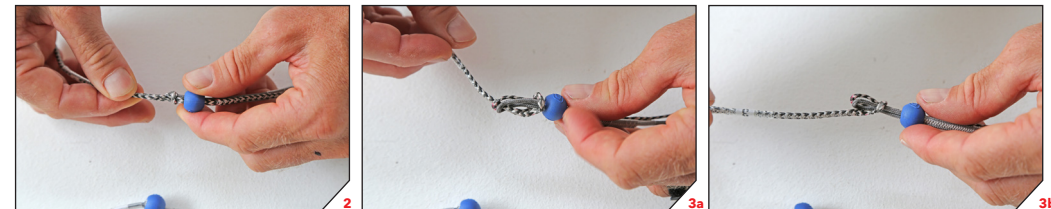
1. Align the lower ends of PA1 and PB1.
2. Ask an assistant to hold lower ends even, or use a ground stake (or a screw driver) through the lower end loops.
3. Apply even tension through the Speed System by pulling on the A and B bridle line groups attached to the upper ends of PA1 and PB2 respectively.
4. The overall length of the Speed System should measure 528mm from the lower ends to the upper ends.
5. If measurement points A and/or B are not positioned evenly or at 528mm the Speed System lines have likely shrunk or stretched and/or might be damaged.
6. Check all Speed System lines to their specs and replace as necessary.



PULLEY LINE REPLACEMENT

The sheathed pulley lines (PB1 & PB2) will likely wear the fastest. Check them before every session. Spare pulley lines are supplied in the kites repair kit.

1. Disconnect the flying lines and lay the Speed System out in an open area.
2. Slide the stopper off the PB1 and PA1 connection.
3. Disconnect the front pigtail (#2 or #3).
4. Remove PB1 from the stopper ball. Keep PA1 running through the stopper ball.
5. Remove PB1 from the pulley.
6. Take the PB1 replacement line and feed it through the pulley.
7. Feed a thin mouse line through the stopper ball (use the spare bridle line from the kites repair pack)
8. Feed the mouse line through the end loop of PB1.
9. Feed the mouse line back through the stopper ball.
10. Pull PB1 through the stopper ball.
11. Remove the mouse line.
12. Connect PB1 and PA1 to the front line pigtail (#2 or #3).
13. Slide the stopper ball over the PB1 and PA1 connection.
14. Repeat the same process for the other speed system side. Always check your speed system and replace lines when excessive wear shows.



PULLEY LINE REPLACEMENT (CONTINUED)

