

SERVICE BULLETIN

Title: Streak 3 & Cruze Wing Knuckles

Identification	SB-003
Status	Mandatory
Issue	2
Issue Date	April 2006
Applicability	Streak 3 serial numbers S3-01 to S3 -92 inclusive Cruze serial numbers CZ-001 to CZ-42 inclusive unless previously accomplished.
Compliance	At or before the next 100 hourly inspection, but not after 1 August 2006.

Issued by: Scott Barrett

Approved by: The technical content of this service bulletin has been approved by the Australian Civil Aviation Safety Authority

Summary of Changes

Second issue: inclusion of replacement part numbers, new assembly drawings, assembly and checklist for maintenance release.

Introduction

The knuckles on Streak 3 & Cruze Wing control frames have exhibited stress corrosion cracking. This service bulletin details disassembly, fitment of new parts and a checklist for maintenance release. A kit of replacement parts is referenced, part number 107728. This service bulletin replaces issue 1, where issue 1 was concerned with the inspection program.

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Action

- Order the Streak 3 & Cruze Wing Knuckle replacement kit, part number 107728. Place your order with your local Airborne Dealer or to the AirBorne WindSports Factory. Provide the following details upon placing an order:
 - Your name
 - Wing serial number
 - Postal address
 - Payment option details
 - Contact details, email and or telephone contact.
- Removal of the in service parts,
- Replacement with new parts,
- Conduct an inspection according to the checklist, attach the checklist into the wing maintenance manual.
- Complete the Safety Bulletin Compliance form and attach it to the maintenance history in the wing maintenance manual.
- Send a copy of the Safety Bulletin Compliance form to the AirBorne WindSports factory.
- Complete a return to service note in the aircraft logbook.

Skills

Where allowable by the applicable national airworthiness authority according to the category of registration, the owner / maintainer can incorporate this service bulletin with care.

Weight and Balance

Insignificant or negligible change.

Parts Replacement Program

Replacement components are available to aircraft owners free of charge upon request to your local AirBorne Dealer or to the AirBorne WindSports Factory.

Please order the Streak 3 & Cruze Wing Knuckle replacement kit, part number 107728.

Replacement parts supplied in this kit will only be invoiced if the compliance form (as contained in this document) is not returned to the AirBorne WindSports Factory within 3 months of issue of the parts.

Kit Contents

The Streak 3 & Cruze Wing Knuckle replacement kit, is part number 107728.

Which contains:

Part Name	Part Number
KNUCKLE AERO 35X85 TOP RHS	106204
KNUCKLE AERO 35X85 TOP LHS.	106205
A-FRAME TOP BRACKET AERO D-T TRIKE. 2 of assembly	107503
KNUCKLE RD BASE BAR AERO D-T. 2 of	107510
KNUCKLE AERO 35X85 BOTTOM RHS.	107476
KNUCKLE AERO 35X85 BOTTOM LHS	107475
"O" RING FUEL TANK. 4 of	103181
TRIMMER BUSH TW AERO TOP KNUCKLE.	106290
LOCTITE 243, SACHET, decanted from part # 103706	-
DRY LUBE, SMALL PORTION, cut from part # 106432	-
HEAT SHRINK. 20mm wide, cut length 45mm cut from # 102029	-
NUT NYLOC AN5 HALF	100037
NUT NYLOC AN4 HALF	100035
EXPLODED PARTS DRAWING: DOWN TUBE S3 RHS WITH WIRES	DWG A4 – 6481 REVISION 2
EXPLODED PARTS DRAWING: DOWN TUBE S3 IHS WITH WIRES	DWG A4 – 6476 REVISION 2
This service bulletin SB-003 issue 2, as a paper copy.	SB-003 issue 2

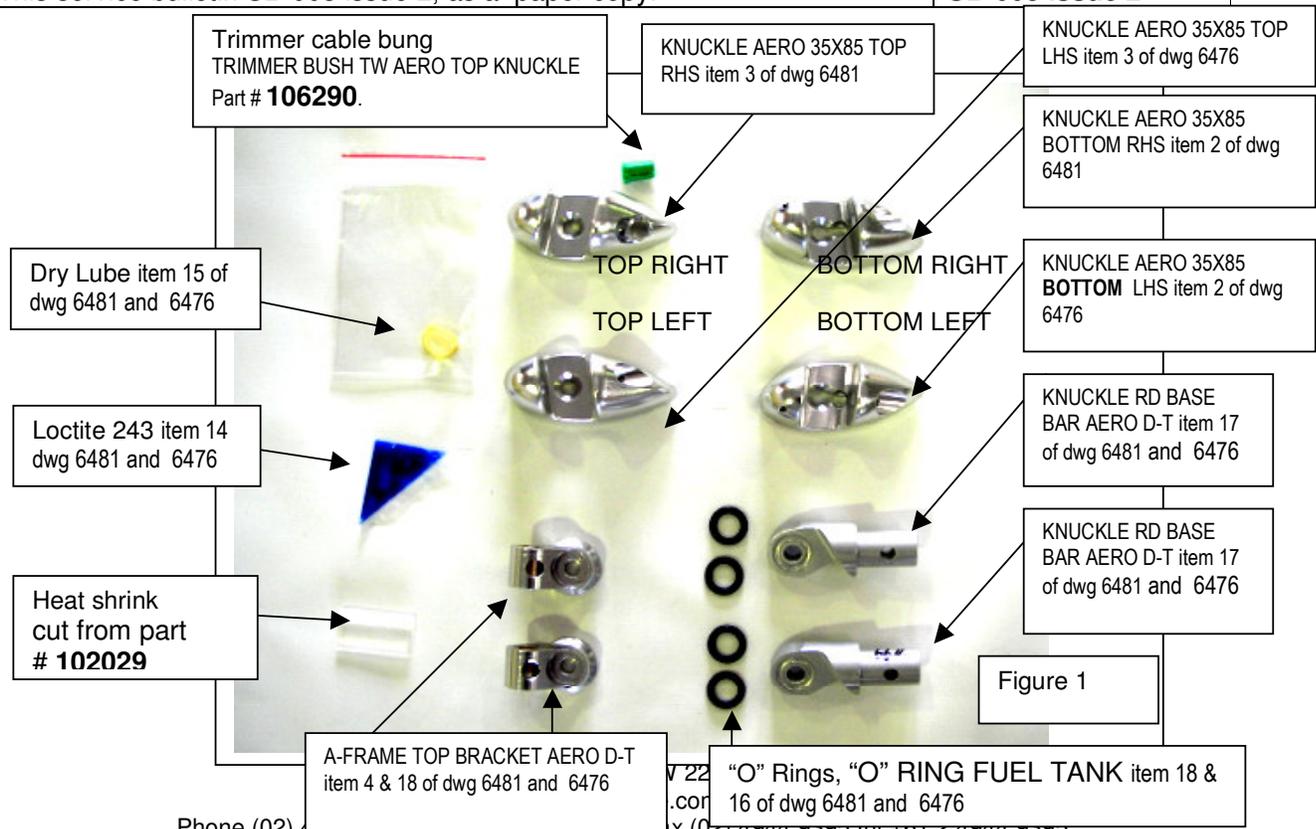


Figure 1

Tooling

- Flat blade screwdriver
- knife
- Needle nose pliers
- 2 x 1/2" sockets & ratchets
- 1 x 7/16 socket and spanner
- Soft faced hammer or mallet
- 4mm Allen key
- 3mm Allen key

Not shown

- Corrosion inhibitor, Water dispersant (WD 40, RP7, Lanotec GP-21 or similar)
- Support post or rope as optional wing support methods.



Figure 2

Documentation

The inspection checklist and the compliance notice are both attached at the rear of this document; both should be filled out and entered in the rear of the wing maintenance manual. Please send a copy of the Safety Bulletin Compliance form to the AirBorne WindSports factory to complete the processing of your order, this will ensure that you are not invoiced for the parts supplied.

The person who has performed the inspection of the work should place an Approval for Return to Service in the aircraft logbook.

A maintenance release approval notice may take the form:

"Installed new Streak 3 & Cruze Wing Knuckle replacement kit, part number 107728 in accordance with AirBorne WindSports Service Bulletin SB-03 issue 2."

Performing the Replacement of Parts

Disassembly Procedure

1. With the wing removed from the trike base. Remove the 3 tip battens on each side, fold the tip struts and place tip covers on.
2. De-tension cross bars.
3. Release nose catch.
4. Support wing by either:
 - a. suspending from roof or
 - b. suitable support post; cut support post to 1800mm and place under nose channel (making sure wing can not move or blow off support post). Bottom rear wires should be slack). See figure 3.

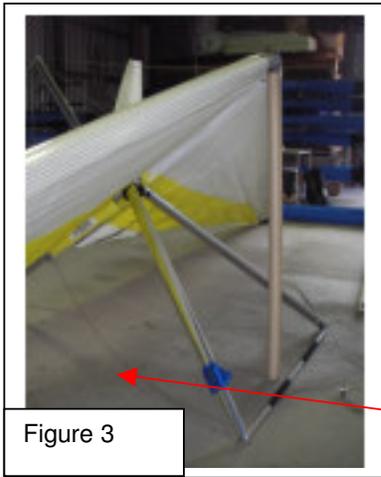


Figure 3

Note: loose rear wires

5. Cut heat shrink from trimmer cable joiner, making sure not to cut or damage wire
6. Undo trimmer wire shackle. See figure 4.
7. Remove shackle pin and remove wire
8. Pull the trimmer wire through sail eyelet
9. Remove base bar from control frame by removing the PIP pin and the outer bolt on the base bar (7/16 socket and spanner)
10. Undo and remove AN5 bolt that passes through the u bracket attaching both down tubes, see figure 5.

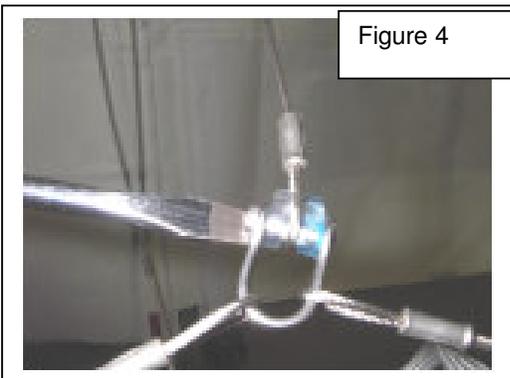


Figure 4

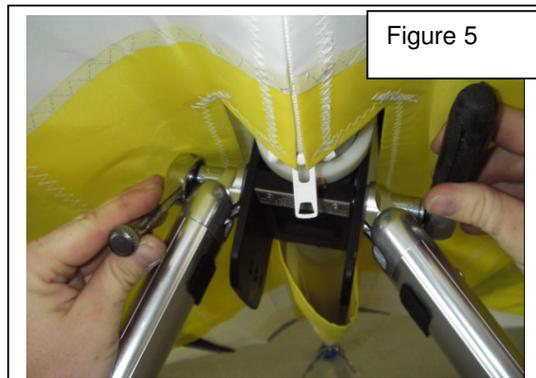


Figure 5

11. Lower both down tubes down onto a flat non scratch surface, as per figure 6.

Remove Bottom Knuckles

12. Remove locking screw using a 3mm Allen key. Remove 4mm locking cap screw from bottom fitting. Note, if difficulty occurs removing locking screw, turn shoulder bolt in clockwise first (Locking screw is ITEM 7 SKT CAP SCREW SS M4X8, shoulder bolt is item 9 in exploded parts view, drawing 6476.). See figure 7.

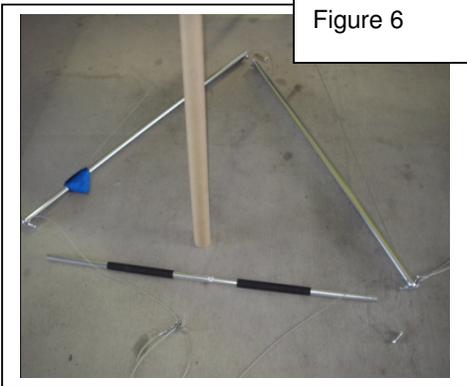


Figure 6



Figure 7

13. Remove the shoulder bolt that holds the side wires, shackle and knuckle. Using a 4mm Allen key. See figure 8.

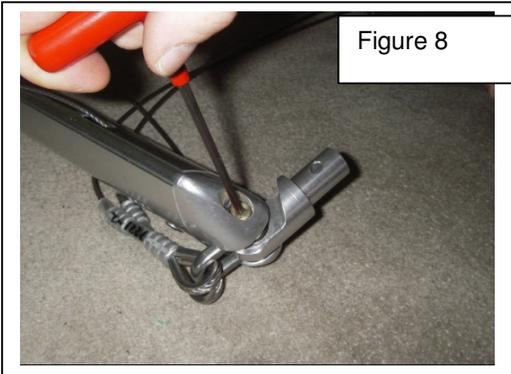


Figure 8

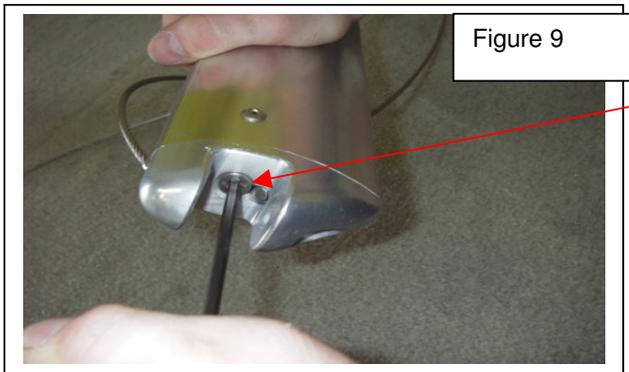


Figure 9

- 14. Remove the 6mm countersink head screw that holds the knuckle to the down tube using a 4mm Allen key (item 8 in exploded parts view, drawing 6476). Remove the knuckle completely. See figure 9.
- 15. Remove locking plug (item 16 of DWG 6476, part number 1064345) and wires from knuckle. Repeat process for left hand bottom fitting. See figure 10.

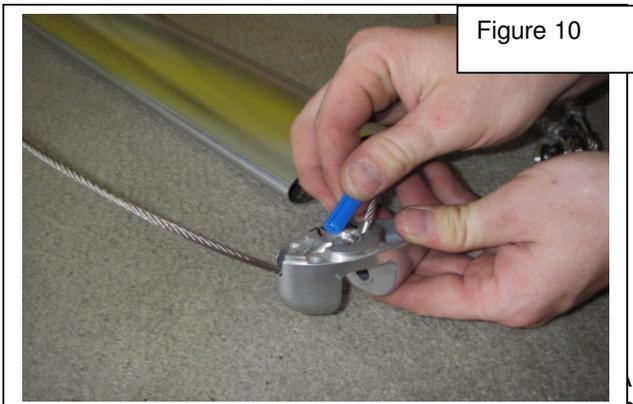
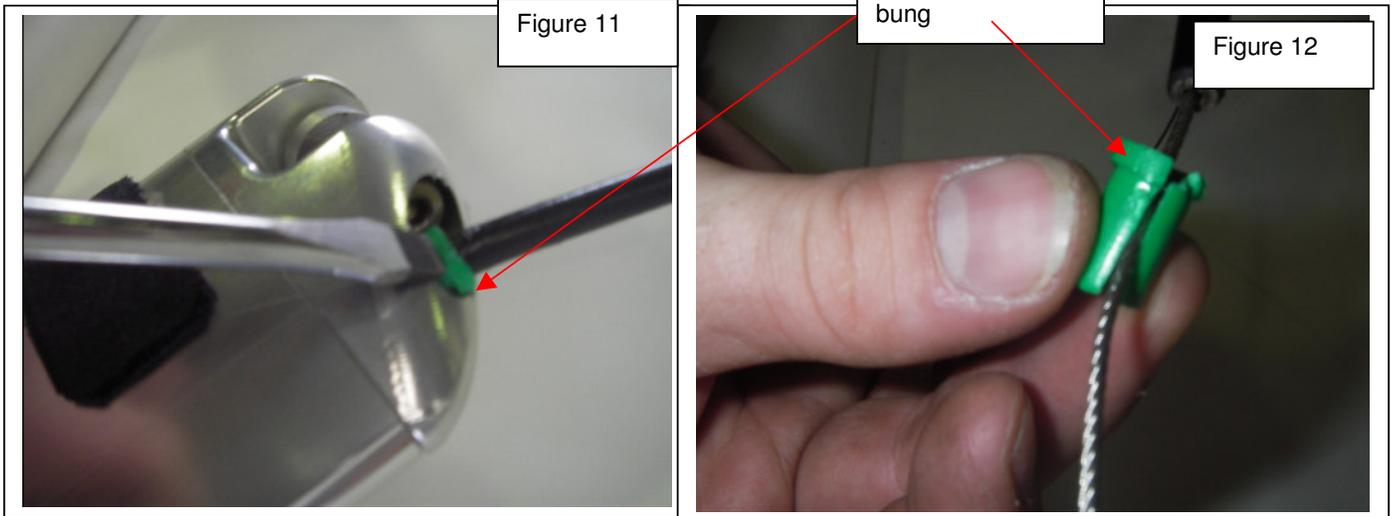


Figure 10

NOTE: If removing ball swages from fittings is difficult spray with a penetrant and leave for a period of time. Work ball swage out using a scriber or small screw driver. Be careful not to kink the wire.

Remove Top Knuckles

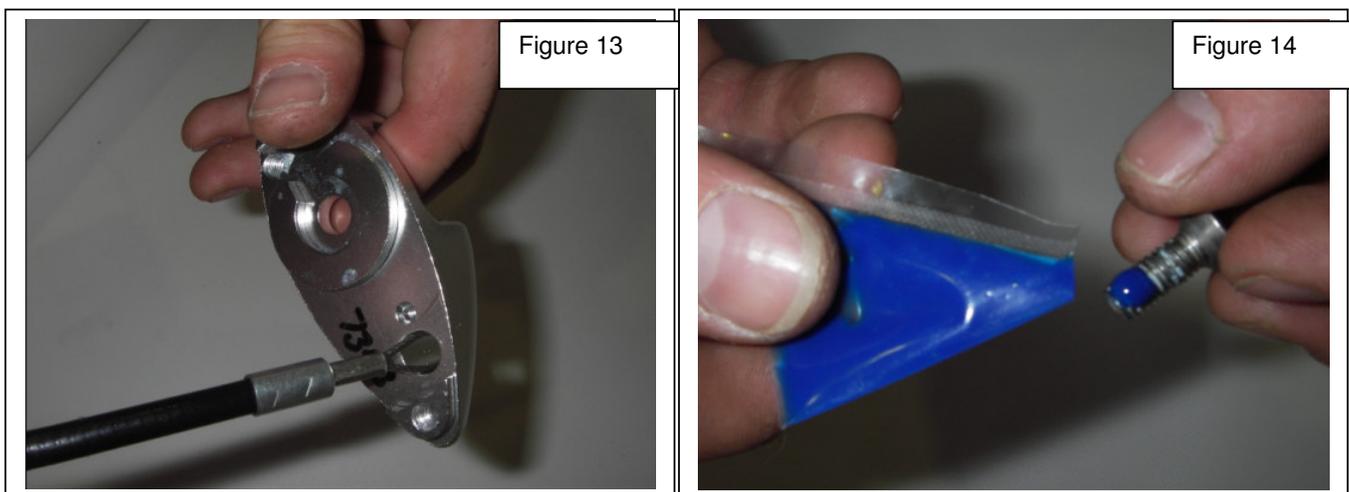
16. Remove the locking screw from top fitting using a 3mm Allen key.
17. Using a flat head screw driver and small mallet lightly tap out plastic trimmer cable locating bung.
18. Remove bung from wire using access slot.



19. Remove shoulder bolt (item 9 in exploded parts view, drawing 6476).
20. Remove countersunk screw that secures the knuckle to the down tube
21. Remove the top knuckle item 3 in IPC exploded parts.
22. Repeat process for the other side exempting trimmer cable instruction

Fitting New Top Knuckles

1. Remove the old knuckles from the work area to avoid refitting them. The new knuckles can be identified as they do not have lightening features in them.
2. Pass trimmer cable through the new right hand top knuckle, as per figure 13, item 3 in IPC exploded parts.
3. Fit countersunk head screw (item 7 of drawing 6481, using 243 loctite (tighten down firm making sure gap between fitting and down tube is closed up).



4. Apply a coating of dry lube on shoulder bolt, figure 15.
5. Fit u bracket knuckles item 18 of drawing 6481. The two nylon washers are re-used. See figure 16.
6. Tighten shoulder bolt lightly, item 8 of drawing 6481, making sure knuckle is in correct orientation.

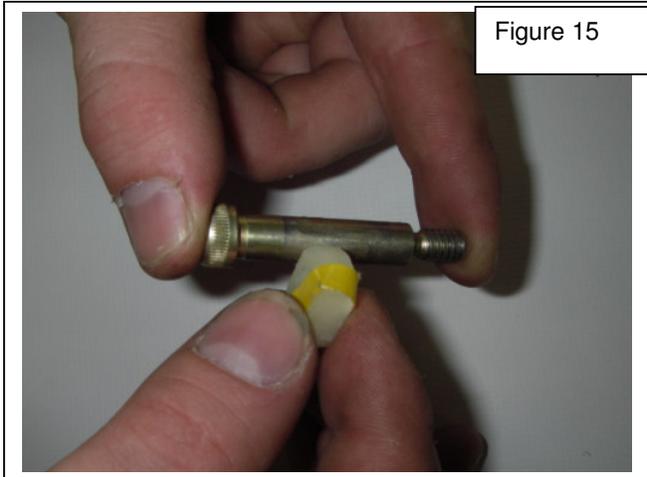


Figure 15

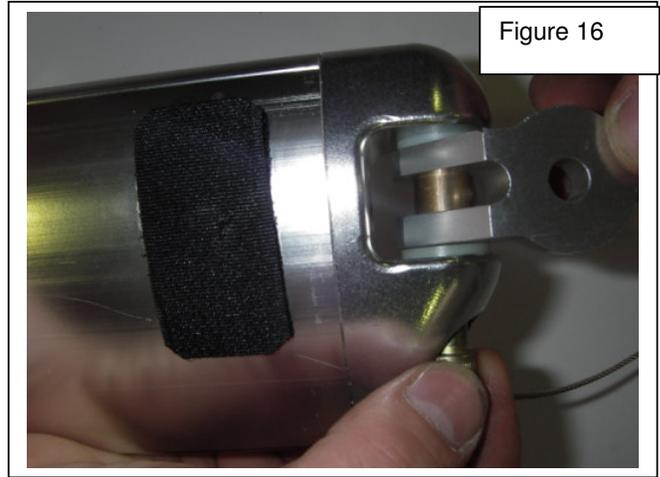


Figure 16

7. Fit new trimmer cable locating bung, see figure 17
8. Leave approximately 60mm of outer cable hanging out past the bung, see figure 17.
9. Orientate slot in bung (shown figure 12) towards the shoulder bolt (forwards).
10. Using needle nose pliers lightly tap in trimmer locating bung. see figure 17.
11. Fit 4mm locking cap screw using loctite 243.
12. Repeat process for left hand top fitting exempting trimmer cable instruction

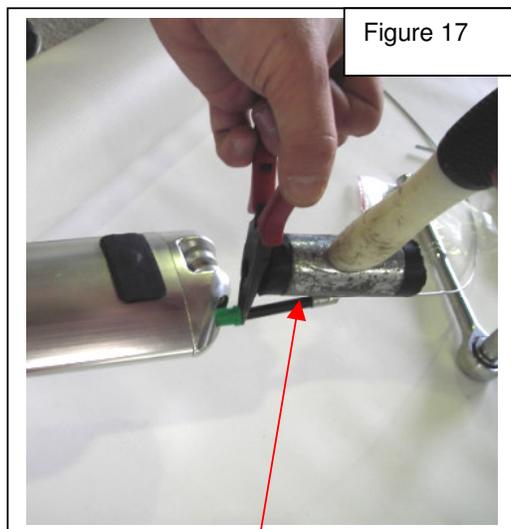
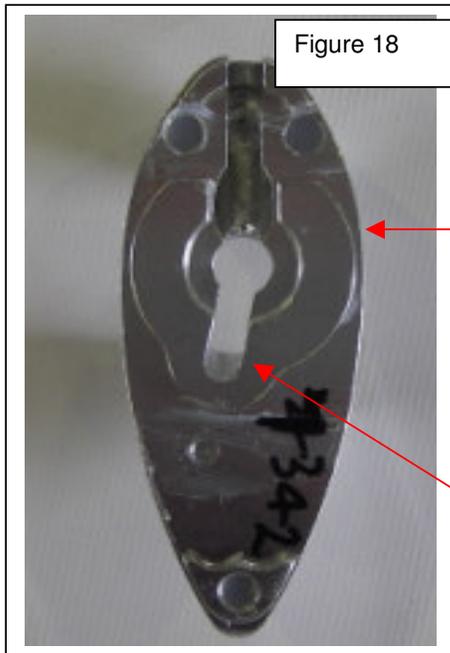


Figure 17

60mm of cable hanging out past bung

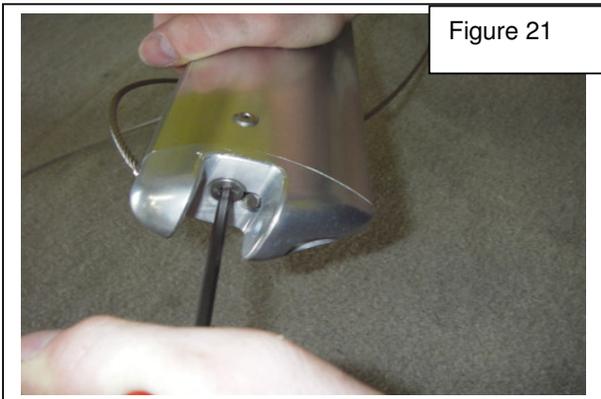
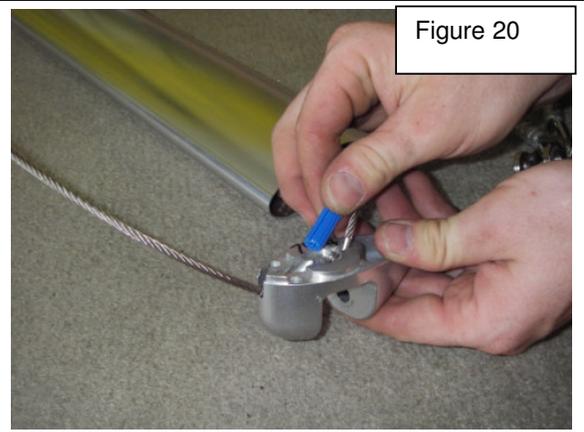
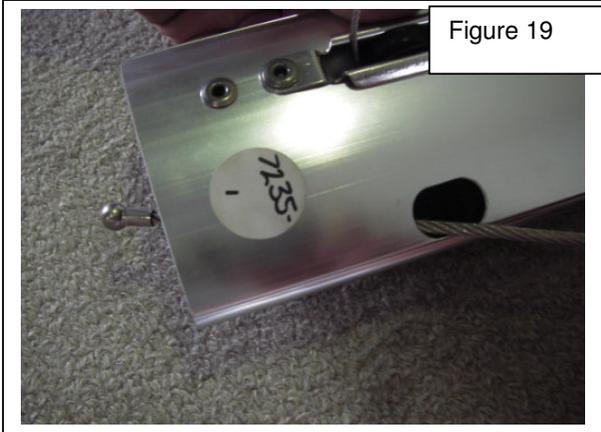
Fitting New Bottom Knuckles



Right hand knuckle
Top view

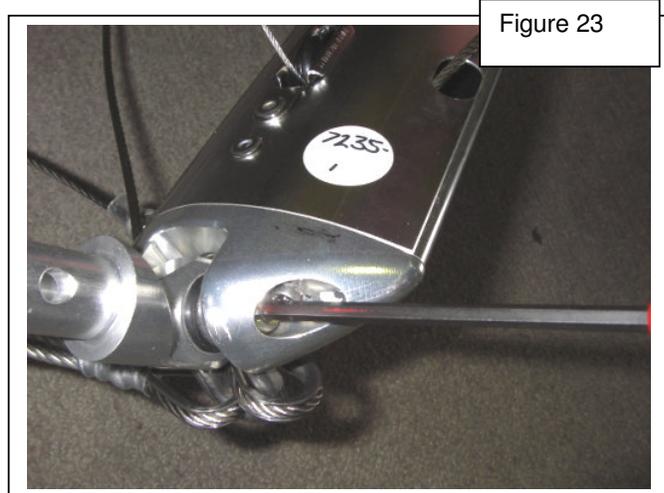
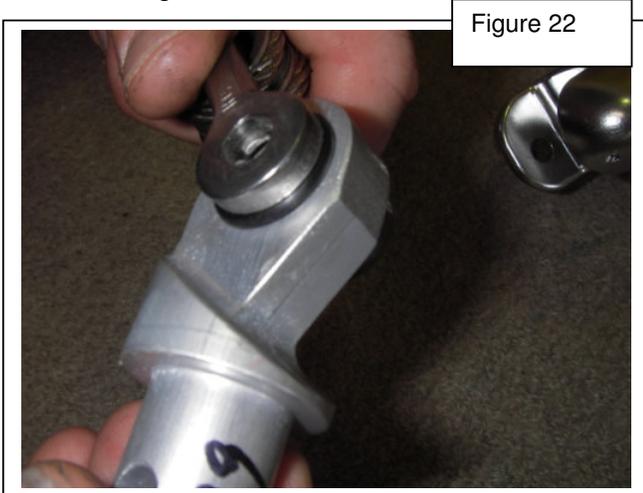
Note: the rear end of the slot
is canted inboard.

13. Pass rear wire through slot in down tube.
14. Place ball swages in the knuckle, making sure that they are fully bottomed in the groove.
15. Slide the front wire retaining plug into front wire groove (TUBE PVC CLEAR, item 15 of drawing 6481) to hold the front wire swage in place.



16. Assemble knuckle to down tube using countersunk screw (item 7 of drawing 6481) and 243 loctite.
17. Pull on rear wire whilst tightening down screw firmly (This is to ensure rear wire ball swage is seated)

18. Coat the 4 "O" rings (item 16 of drawing 6481) in dry lube. Place the O rings into item 17 of drawing 6481, as shown in figure 22.
19. put the side wires (items 11 and 12) over the D shackle (item 4 of drawing 6481). Fit shackle over "O" rings on knuckle as shown in figure 22.
20. Make sure the side wires aren't twisted or tangled.
21. Fit into bottom knuckle item number 2 of drawing 6476 and 6481, use the drawings to check the orientation of the fittings.
22. Coat shoulder bolt (item 8 of drawing 6481). in dry lube.
23. Fit shoulder bolt (item 8 of drawing 6481). and lightly tighten. NO LOCTITE GOES ON THIS BOLT. The bolt should be installed so that it is seated finger tight, it is not to be over tightened.



24. Using blue loctite 243 and 3mm Allen key, reinsert the locking screw (item 6 of drawing 6481).
25. Repeat these procedures for the other side.
26. Spray corrosion inhibitor through the small drain hole at the bottom of the fitting and wire entry slots.

Note:

An assembly drawing for the downtube and knuckle is provided attached to the end of this document. The previous design used nylon washers on the sides of the base bar knuckle. These may be discarded or kept as spares for the top knuckle assembly.

Reattach the Control Frame

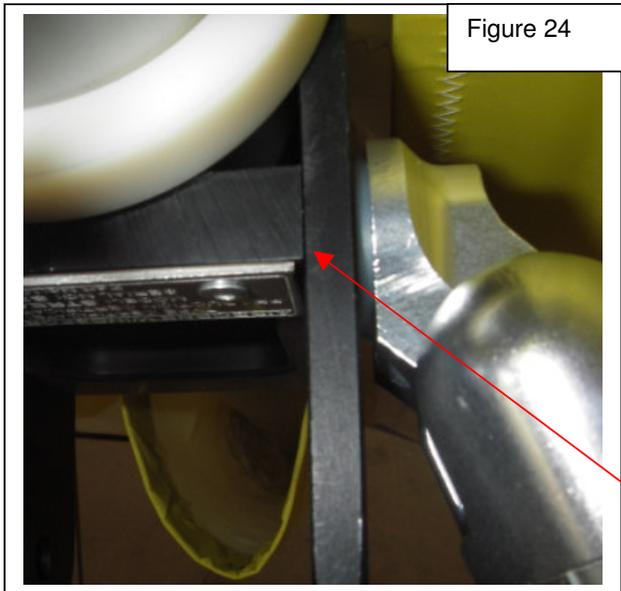


Figure 24

1. Apply dry lube around u bracket hole and on top knuckle.
2. Fit down tubes to u bracket using new nyloc nut , AN 5 Half Nut, part number 100037, with nylon washers between fitting and u bracket.
3. Tighten AN5 u bracket cross bolt down firmly so as to close any gaps between u bracket and negative load plate. See figure 24

Close any gaps between plates

4. Fit base bar with fixed bolt on the right hand side using new nut (NUT NYLOC AN4 HALF part number 100035). Fit pip pin to the left hand side.
5. Attach nose catch checking for any twists in wires.
6. Remove temporary support from nose.

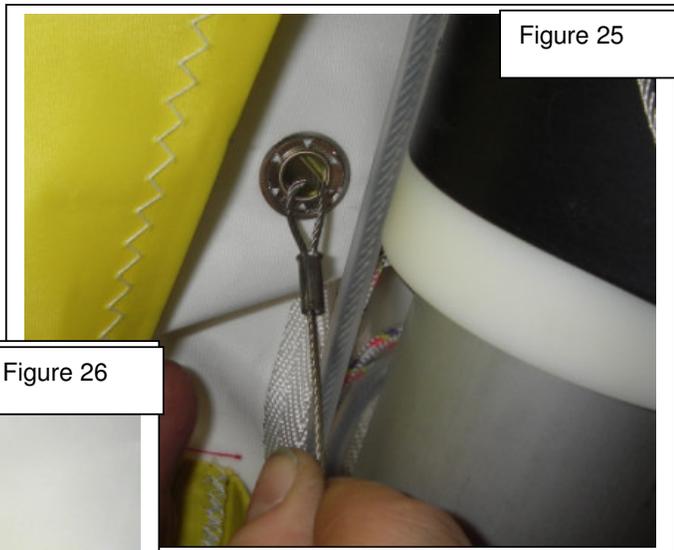


Figure 25

7. Feed trimmer cable back through eyelet hole in sail. See figure 25.

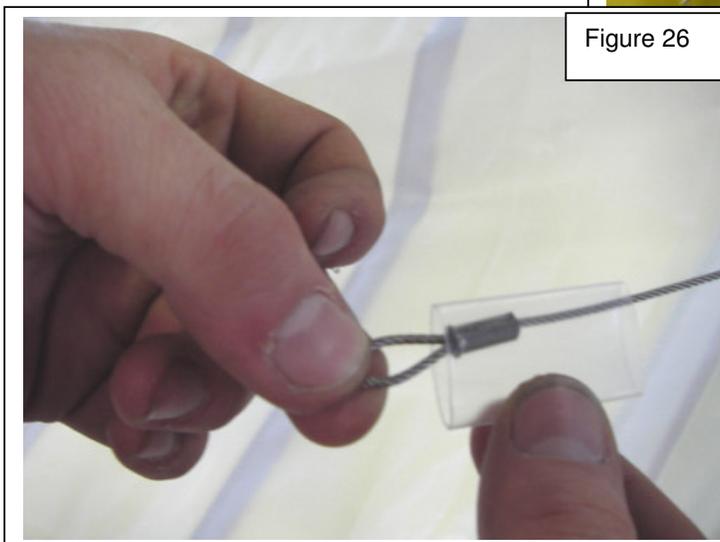


Figure 26

8. Slide heat shrink over trimmer cable. See figure 28.

9. Re-assemble shackle and attach wire (note: make sure plastic insert is correctly fitted with trimmer wire centred in slot).

10. Slide heat shrink back over shackle and shrink down using a suitable heat source.

Wire centred in plastic insert

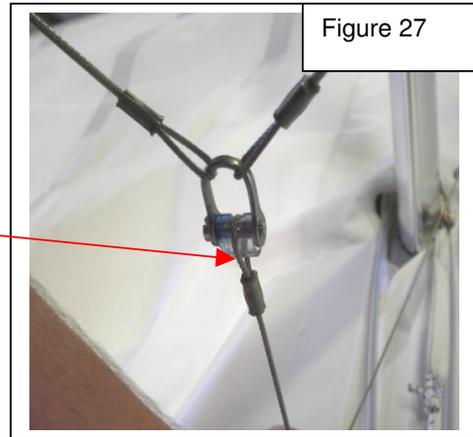


Figure 27

11. Re-tension the sail as per the Pilots Operation Handbook or the Aircraft Operating Instructions.
12. Conduct an inspection on the change over of parts, using the checklist provided in this document.
13. Complete the safety bulletin compliance statement form in duplicate. File one copy in the wing maintenance manual. Post the other copy to AirBorne WindSports.
14. Conduct a full pre flight of wing and base before return to service.
15. Make a return to service note in the aircraft logbook.

Checklist

Complete this checklist on the completion of the installation of the new components.

Check, mark with tick as applicable	Item to check.
	Trimmer cable has approximately 60mm of outer sheath showing at top of top knuckle.
	Trimmer cable bung is located
	Loctite is applied to all locking screws
	Shoulder bolts have no Loctite on them.
	Shoulder bolts have dry lube applied to the shoulder sections.
	Corrosion inhibitor has been applied to the bottom knuckles.
	All wires are connected to the knuckles and are secure.
	All knuckles are firmly attached to the uprights of the control frame. Pull test by hand.
	The keel roller bracket has no gaps showing between the plates.
	The An 5 U bracket cross bolt has threads showing beyond the nut.
	Trimmer cable U bracket is oriented curve up.
	Trimmer cable U bracket is secured and heat shrink covered..
	The wires are free of tangles and twists, kinks, for wire orientation refer to exploded parts drawings 6476 and 6481.
	Connect the wing to the trike base (with no trainer bars fitted). Move the wing to the tip down parked position. Disconnect the base bar on one side, it should disconnect and reconnect freely. Reconnect the base bar and PIP pin connection.
	The pip pin an base bar bolts and nuts are in place.
	Trainer bars if fitted, have pip pins in place, washers wing nuts and locking pins are all in place.
	Sign the service bulletin compliance statement, store one copy in the wing maintenance manual, post one copy to AirBorne WindSports.
	Complete the safety bulletin compliance statement form in duplicate. File one copy in the wing maintenance manual. Post the other copy to AirBorne WindSports.
	Conduct a full pre flight of wing and base before return to service
	Make a return to service note in the aircraft logbook.

Safety Bulletin Compliance

SB-003 Streak 3 & Cruze Wing Knuckles

This template is to be completed by a person with appropriate maintenance authority as determined by the National Airworthiness Authority in the country of registration, for the category of registration of the aircraft.

Wing Serial Number

-	
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I/we have incorporated Service Bulletin SB – 003, for the above aircraft component

Signed:	
Print Name	

Once complete inset sheet in rear of applicable maintenance manual.

Safety Bulletin Compliance

SB-003 Streak 3 & Cruze Wing Knuckles

This template is to be completed by a person with appropriate maintenance authority as determined by the National Airworthiness Authority in the country of registration, for the category of registration of the aircraft.

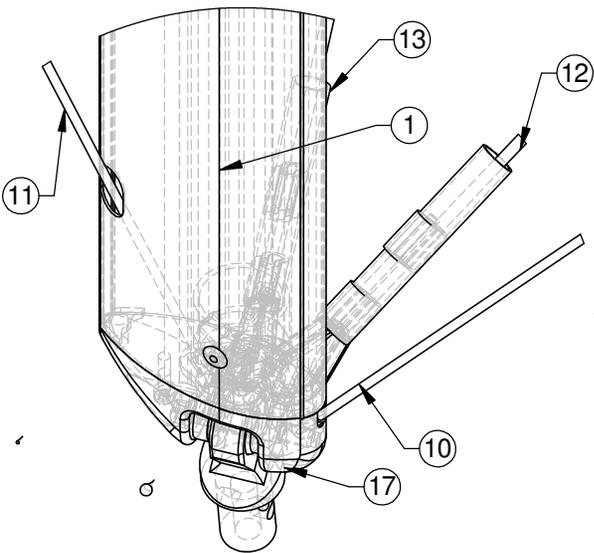
Wing Serial Number

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I have incorporated Service Bulletin SB – 003, for the above aircraft component

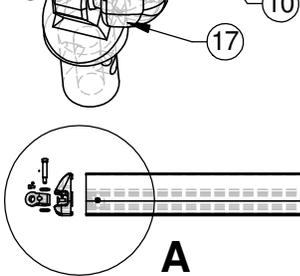
Signed:	
Print Name	

Once complete inset sheet in rear of applicable maintenance manual. Fill in the duplicate form and post to AirBorne WindSports Factory, to be received within 3 months of issue of the parts to avoid being invoiced for the kit.



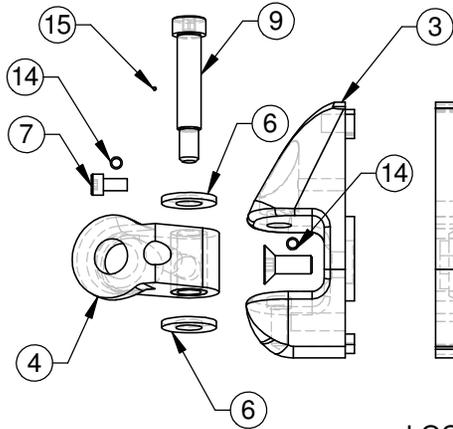
**QUASI ISOMETRIC VIEW
SCALE 1:2.5**

ITEM NO.	NAME	DWG	PART NO.	QTY.
1	D-TUBE AERO S3-CRUZE LHS SUB-ASSEM	6408	106312	1
2	KNUCKLE AERO 35x85 BOTTOM LHS	6339	106200	1
3	KNUCKLE TW AERO 35x85 TOP LHS	6343	106204	1
4	BRACKET AERO D-T TRIKE BUSHED	6893	107503	1
5	SHACKLE MODIFIED RM-24 HD	6445	106385	1
6	WASHER NYLON M8 STD	5540	100595	2
7	SKT CAP SCREW SS M 4 X 8	5603	106322	2
8	SKT CSK SCREW M6x16 SS	5668	106275	2
9	SKT SHOULDER SCREW 5-16x1-1-4 BSW1-4"	6395	106323	2
10	WIRE BOTTOM FRONT AERO S3	6423	106335	1
11	WIRE BOTTOM REAR AERO S3	6422	106334	1
12	WIRE BOT SIDE FWD AERO S3-CRUZE	6440	106377	1
13	WIRE BOT SIDE AFT AERO S3-CRUZE	6440	106378	1
14	LOCTITE 243 Blue Med Strength	5637	103706	4
15	DRI LUBE SOLID LUBE	5637	106432	2
16	TUBE PVC CLEAR 6mm x 18L	5583	106434	1
17	KNUCKLE RD BASE BAR AERO SLOT	6897	107510	1
18	O-RING FUEL TANK	5932	103181	2



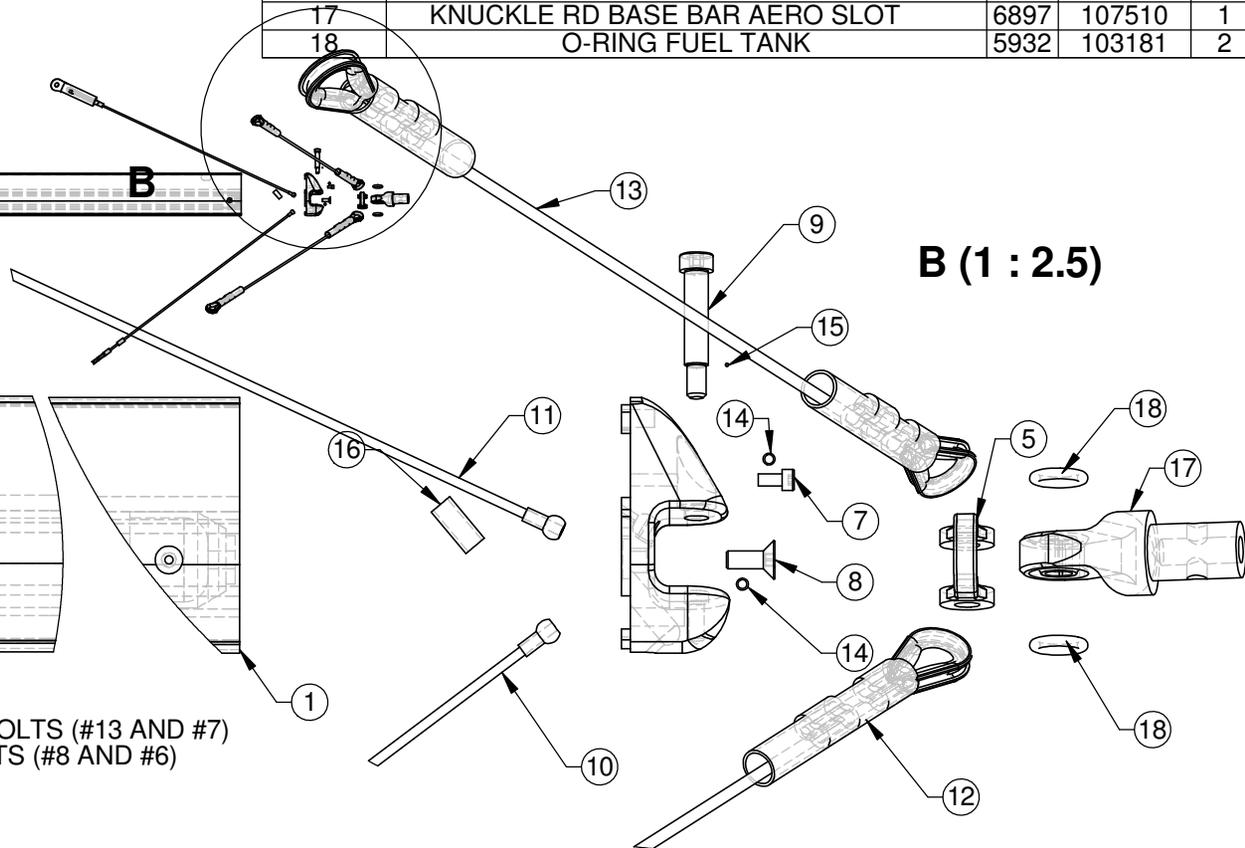
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SCALE 1:15



A (1 : 2.5)

LOCTITE 243 ON LOCKING BOLTS (#13 AND #7)
DRI LUBE ON ROTATING PARTS (#8 AND #6)



B (1 : 2.5)

Rev	AMENDMENTS	Date
1	CHANGED NAME DCR 2095	05-04-05
2	KNUCKLES & BRACKETS DCR 2236	04-04-06

PART NO. 106433 - 0

LAST ACESSED: Wednesday, 5 April 2006

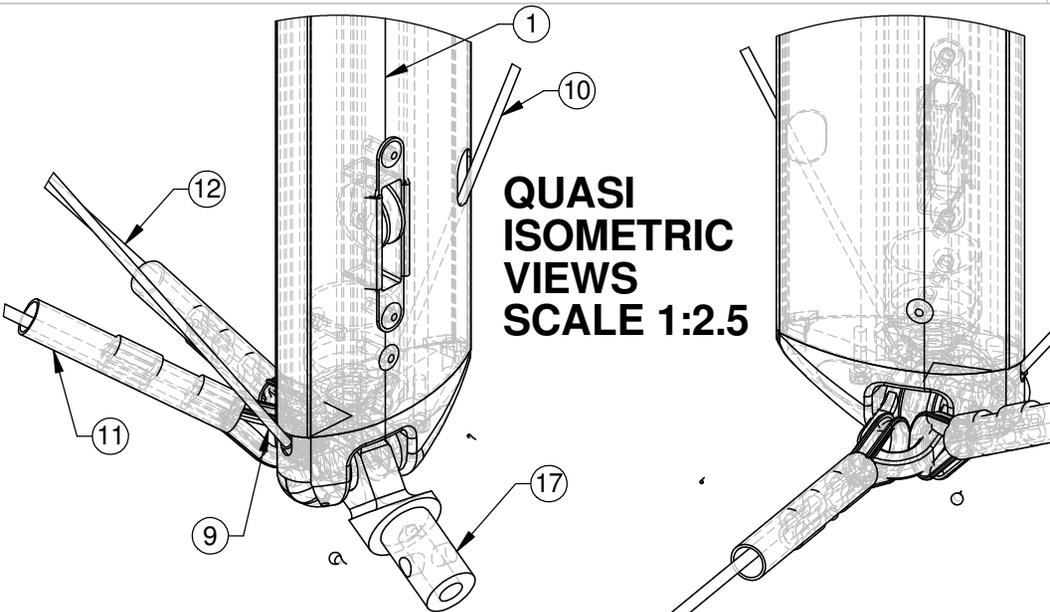
ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE

DOWN TUBE S3 LHS WITH WIRES

Drawn By	Scale	Date
Simon	1:20	24-05-04

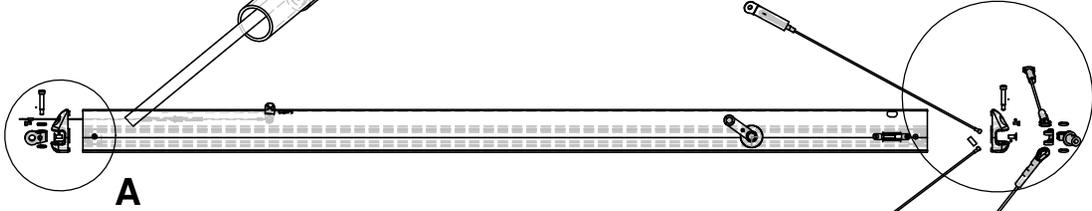


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SHEET 1 of 1

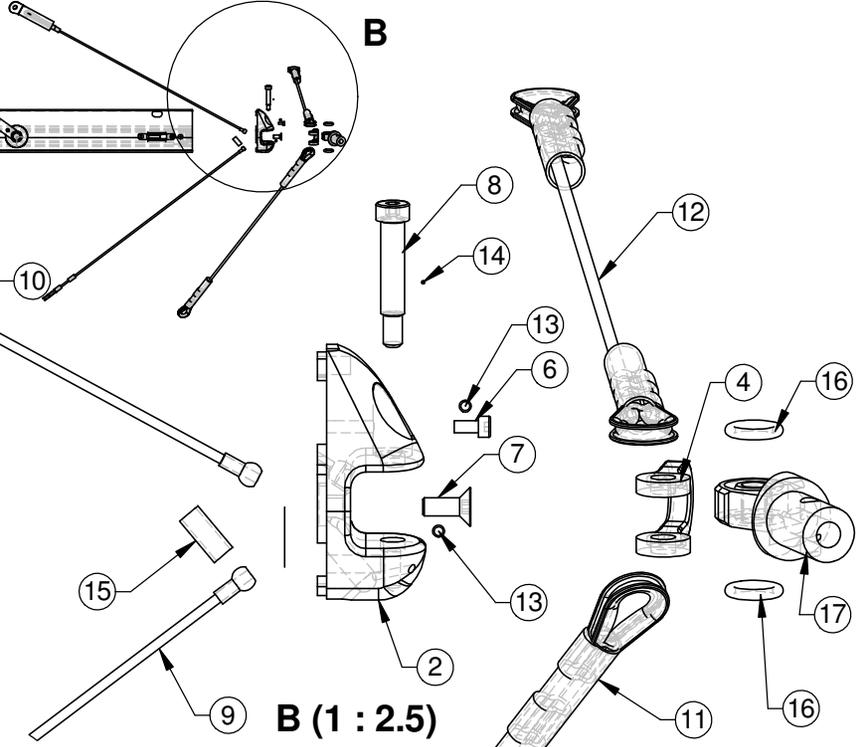


**QUASI
ISOMETRIC
VIEWS
SCALE 1:2.5**

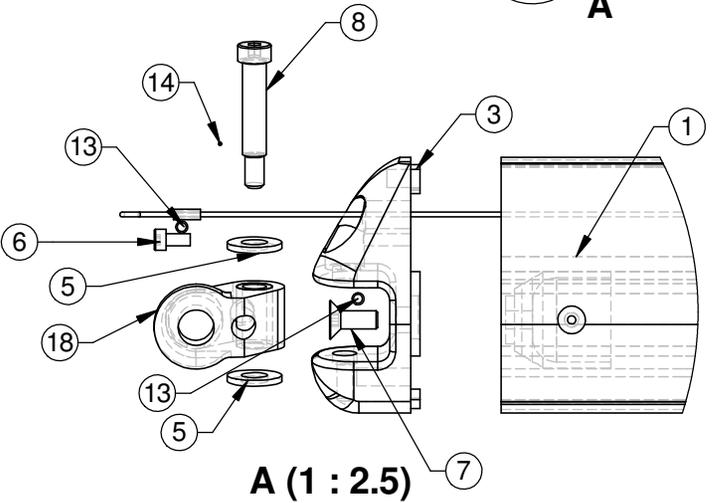
ITEM NO.	NAME	DWG	PART NO.	QTY.
1	TRIMMER ASSEMBLY AERO D-TUBE	6409	106313	1
2	KNUCKLE AERO 35X85 B RT 6061	6890	107476	1
3	D/TUBE TOP KNUCKLE AERO 35X85 RHS	6344	106205	1
4	SHACKLE MODIFIED RM-24 HD	6445	106385	1
5	WASHER NYLON M8 STD	5540	100595	2
6	SKT CAP SCREW SS M 4 X 8	5603	106322	2
7	SKT CSK SCREW M6x16 SS	5668	106275	2
8	SKT SHOULDER SCREW 5-16x1-1-4 BSW1-4"	6395	106323	2
9	WIRE BOTTOM FRONT AERO S3	6423	106335	1
10	WIRE BOTTOM REAR AERO S3	6422	106334	1
11	WIRE BOT SIDE FWD AERO S3-CRUZE	6440	106377	1
12	WIRE BOT SIDE AFT AERO S3-CRUZE	6440	106378	1
13	LOCTITE 243 Blue Med Strength	5637	103706	4
14	DRI LUBE SOLID LUBE	5637	106432	2
15	TUBE PVC CLEAR 6mm x 18L	5583	106434	1
16	O-RING FUEL TANK	5932	103181	2
17	KNUCKLE RD BASE BAR AERO SLOT	6897	107510	1
18	BRACKET AERO D-T TRIKE BUSHED	6893	107503	1



A



B (1 : 2.5)



A (1 : 2.5)

LOCTITE 243 ON LOCKING BOLTS (#7 AND #8)
DRI LUBE ON ROTATING PARTS (#9 AND #6)

Rev	AMENDMENTS	Date
1	CHANGED NAME DCR 2098	05-04-05
2	KNUCKLES & BRACKETS DCR 2236	04-04-06

PART NO. 106437 -
 LAST ACESSED: Wednesday, 5 April 2006
 ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE



DOWN TUBE S3 RHS WITH WIRES			
Drawn By	Scale	Date	
Simon	1:1	07-06-04	



6481
SHEET 1 of 1