

**HANG GLIDER**

**DISCUS**

**OWNER / SERVICE MANUAL**

Size: \_\_\_\_\_

Date of production:

\_\_\_\_\_

Serial number:

\_\_\_\_\_

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# **Discus Owner / Service Manual**

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## INTRODUCTION

Thank you for purchasing an Aeros glider.

We encourage you to read this manual thoroughly for information on the proper use and maintenance of your Aeros glider. If you have access to the Internet, please visit us regularly at <http://www.aeros.com.ua>

***We wish you a safe and enjoyable flying career.***

Aeros Ltd.

## TECHNICAL INFORMATION AND OPERATING LIMITATIONS

The Discus has been designed for foot launched soaring flight. It has not been designed to be motorized, tethered, or towed. It can be towed successfully using proper procedures.

Flight operation of the Discus should be limited to non-aerobatic maneuvers; those in which the pitch angle will not exceed 30 degrees nose up or nose down from the horizon, and the bank angle will not exceed 60 degrees.

	Discus 12	Discus 13	Discus 14	Discus 15
Sail area, sq.m. (sq.ft.)	11.6 (125)	12.8 (138)	13.7 (147.5)	14.7 (158)
Wing span, m (ft.)	9.2 (30)	9.6 (31.5)	10 (32.8)	10.3 (33.8)
Aspect ratio	7.3	7.2	7.3	7.2
Nose angle, °	125-128	125-128	125-128	125-128
Pilot clip weight optim., kg (lb)	65 (143)	75 (165)	85 (187)	95 (209)
Weight (without bags), kg (lb) *	25 (55)	30 (66)	31 (68)	33 (73)
Number of upper sail battens	18	20	20	20
Number of bottom sail battens	4	4	4	4
Breakdown length, m (ft) *	4.7/3.8	4.9/3.94 (16.1/12.9)	5.1/4.1 (16.7/13.4)	5.2/4.2 (17/13.8)
Tested load, G	+6 / -3	+6 / -3	+6 / -3	+6 / -3
Wind speed max, m/sec (mph)	12 (27)	12 (27)	12 (27)	12 (27)
Min. airspeed, km/h (mph)	29-30 (18-19)	29-30 (18-19)	29-30 (18-19)	29-30 (18-19)
Max. airspeed, km/h (mph)	80 (50)	80 (50)	80 (50)	80 (50)
Min. clip-in weight, kg (lb)	50 (110)	65 (143)	75 (165)	85 (187)
Max. clip-in weight, kg (lb)	80 (177)	100 (220.5)	115 (254)	125 (276)

\* - Discus B model allows breakdown into a 2-m package

Aeros recommends that no attempt should ever be made to deliberately spin the glider.

The stability, controllability, and structural strength of a properly maintained Discus have been determined to be adequate for safe operation when the glider is operated within the entire manufacturer specified limitations.

No warranty of adequate stability, controllability, or structural strength is made or implied for operation outside of these limitations.

Operation of the glider by unqualified pilots may be dangerous.

Operating the Discus outside of the above limitations may result in injury and death.

Flying the Discus in the presence of strong or gusty winds, or turbulence may result in loss of control of the glider, which may lead to injury and death.

Do not fly in such conditions unless you realize and wish to personally assume the associated risks.

## DISCUS REASSEMBLY AFTER SHIPPING AND BREAKDOWN FOR SHIPPING PROCEDURES

The front leading edge is 60 mm oversleeved with 62 mm at the crossbar junction. The rear leading edge is 50 mm oversleeved with 52 mm at the washout tube "outboard sprog" attachment point. The rear end of the aft leading edge contains a receptacle for the tip wand, secured in place by a clevis pin and a small screw 12 mm from the end of the tube. The clevis pin also passes through a grommet on the rear sail mount webbing strap and secures this strap to the rear leading edge.

### REASSEMBLING THE DISCUS AFTER BREAKDOWN FOR SHIPPING

1. Lay the glider down on it's back (bag zipper up) on a smooth, clean work surface. Unzip the glider bag, pull it off of the glider at the front and rear, flip the glider upside down to the kingpost up position, remove the velcro ties and unfold the sail to it's full length.

2. Identify the rear leading edges as to left and right in order to make sure you are mounting the correct rear leading edge into the correct front. Check the "right" / "left" marking on the rear leading edges. The *photo 1* shows the right rear leading edge, in a right side up orientation.

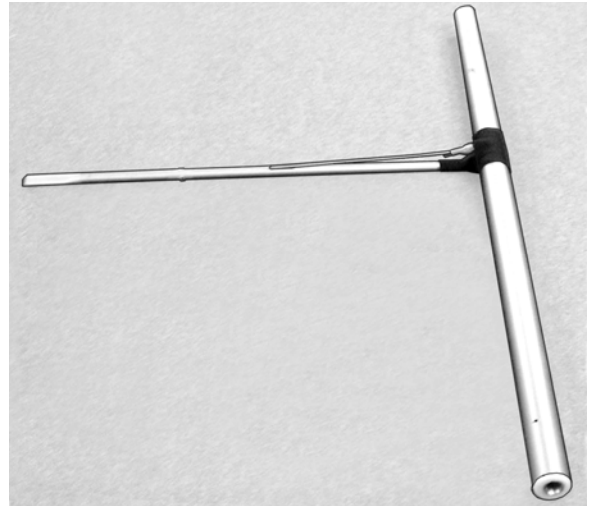


Photo 1

3. Working on one wing at a time, and working with the appropriate rear leading edge, fold the outer sprog, which is attached to the rear leading edge "forward" against the rear leading edge. Slide the outboard end of the leading edge tube into the sail through the sail mount strap zipper. (The *photo 2* shows the right rear leading edge being inserted into the sail as described.)

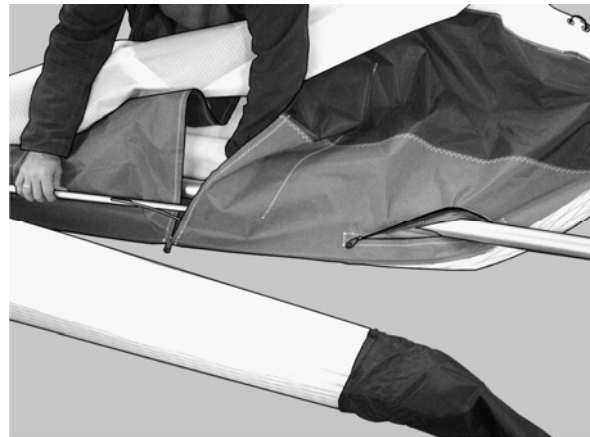


Photo 2

Then slide the rear leading edge forward, allowing the sprog end to come outside the sail at the long "access zipper", and slide the rear leading edge into the front leading edge. Align the rear leading edge properly so that the sprog bracket is on the inside of the leading edge, and slide the rear leading edge forward, rotating as necessary, until the button spring in the rear leading edge engages securely into the holes in the front leading edge. When the rear leading edge is fully engaged, you will not be able to rotate it.

4. Reach into the sail from the sail mount strap zipper, find the sail mount strap and stretch it towards the aft end of the leading edge. Position the sail mount strap on the bottom of the leading edge tube and make sure the strap is not wrapped around the tube. Remove the safety ring from the clevis pin located 100 mm from the end of the leading edge, remove the clevis pin, and pass it through the grommet in the sail mount webbing. Re-install the clevis pin in the leading edge, and re-install the safety ring on the clevis pin (*Photo 3*).

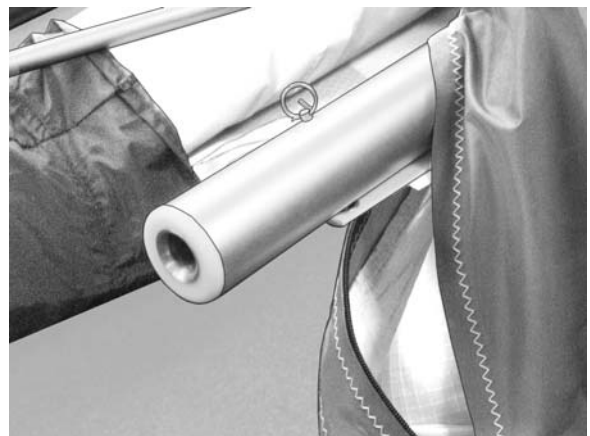
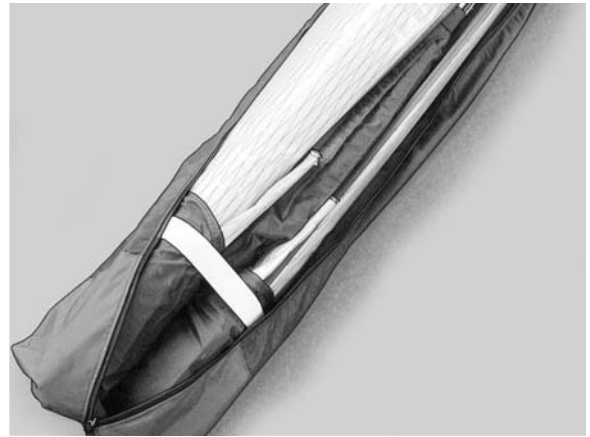


Photo 3

5. Put the outboard end of the rear leading edge into the sail through the sail mount strap zipper. Verify that the sail mount strap is on the bottom of the rear leading edge. Zip up the sail mount strap zipper.

Fold the tip of the sail over, roll it up and re-install the tip bags. Place a velcro ties around the glider at this point. Put the glider bag back on and zip it up (*Photo 4*).



*Photo 4*

## **TO REMOVE THE REAR LEADING EDGES FOR SHIPPING follow these steps**

This process will basically be the reverse of installing the rear leading edges after shipping. Before beginning, read through the section above on how to re-install the rear leading edges. While following the instructions below, refer to the photos in the section above for reference, if necessary.

1. Lay the glider on the ground or floor, unzip the bag and remove the velcro ties. Remove the tip bags and lay the tips out flat. The sprog access zippers should be fully unzipped.

2. Unzip the sail mount strap zipper, reach into the sail to expose the clevis pin, which secures the sail mount strap to the leading edge. Remove the safety ring and washer from the sail mount clevis pin and remove the pin from the leading edge and from the grommet on the sail mount strap. Re-install the clevis pin in the leading edge tube and re-install the safety ring and washer.

3. Check to see that the rear leading edges are marked "Left" and "Right." If they are not, mark them with an indelible marker.

4. With the outboard sprog folded towards the nose pull the rear leading edge straight aft while pressing the button spring in to disengage it from the front, and then slide it backward carefully out of the sail through the outboard sail mount strap zipper. Tape or pad the edges of the front end of the rear leading edge tubes, and the rear of the front leading edge tubes to prevent sail damage during transportation.

5. Carefully fold the rear of the sail over against the front, and replace the bag on the glider.

## **DISCUS SET-UP PROCEDURE**

1. Lay the glider on the ground, with the bag zipper up, with the bag at right angles to the wind.

2. Undo the zipper, remove the battens, and remove the control bar bag.

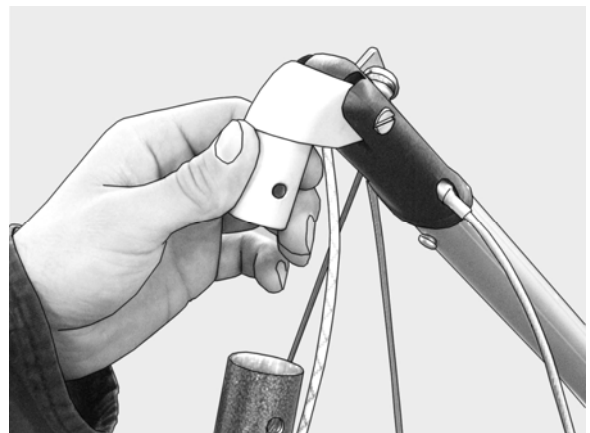
3. Lift and deploy the control bar legs.

Remove the quick pin from the corner bracket. Insert the corner bracket all the way into the basebar, positioning the basebar so that the off-set of the basebar is directed forward in the direction of flight (*Photo 5*).

Install the quick pin bolt (from front to rear), securing the bracket to the basebar. Pass the VG rope through the clam cleat.

*Do not force the fitting into the basebar if it does not slide in freely.*

Check for dirt or damage to the fitting or the inside of the basebar.



*Photo 5*

4. Flip the glider upright on the control bar. Try to set the basebar on level ground. Remove the glider bag and all the velcro sail ties. Do not remove the leading edge tip protection bags at this time.
5. Spread the wings almost all the way. The kingpost will automatically stand upright. If not, lift gently on the top side wire as you spread the second wing, (do not pull the wire to the side) and the kingpost will stand up.
6. Remove the bridle ring from the neoprene cover at the bottom end of the kingpost and attach it to the snap hook, taking care that there is no twist or rotation in the bridle ring which causes the bridle lines to cross over one another (*Photo 6*).



Photo 6



Photo 7

7. Remove the battens from the batten bag, and check each batten for symmetry against the corresponding batten from the other wing. Align the battens at the nose, and at about the 60% chord point as shown (*Photo 7*). There should not be any deviation of more than 3 mm (1/8") from one batten to the other along the full length of the battens.

Aeros convention is that red marked battens go in the left wing and green marked battens in the right. But you can feel free to install them the other way around, i.e. red marked battens go to the right and green marked battens go to the left. This is because Aeros do not tune glider's turn by changing battens camber, so originally your glider comes with left and right corresponding battens symmetrical between each other's. Battens are numbered from the center outwards, and the longest batten in a Discus is designated as the "No. 1" batten. Install the cambered top surface battens in the sail, leaving out the shortest four on each side for now.



Photo 8

Install the batten tips into the hem of the trailing edge (*Photo 8*). At each batten, make sure the opening in the underside of the trailing edge hem is spread to accept the tab on the batten tip. Make sure the tab slides fully into the hem.

*Insert the battens carefully, so as to minimize stress and wear on the sail. Never insert or remove top surface battens with the crossbar tensioned (except for up to the last four on each side) and never insert or remove battens with heavy wind pressure on the top of the sail or in any condition which causes the battens to slide with great resistance in the pockets.*

*If you choose not to check your battens for symmetry before each flight, you should, at a minimum, check them once a month.*

#### **BATTEN TIPS DESIGN**

(*Photo 9*)

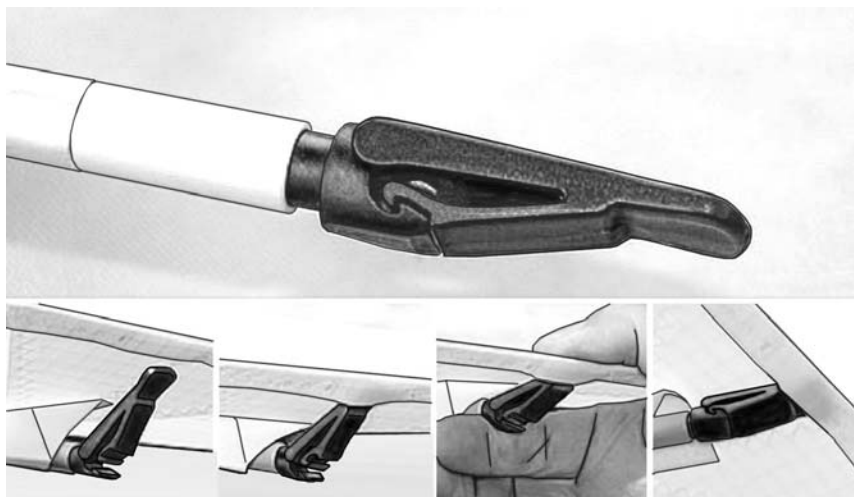


Photo 9

8. Spread the wings all the way and check all cables for any twisted thimbles or tangled cables. At the rear of the keel find the shackle of the sweep (crossbar tensioning) wire. Pull the shackle out the rear end of the keel pocket, and check that the sweep wire is not wrapped around the keel. Attach the shackle of the sweep wire to the hook, which is placed on the keel tube (Photo 10).

An in-flight disengagement of this attachment will cause a complete loss of structural support of the glider and a total loss of control. Never attach the pull handle webbing of the shackle to the hook, even temporarily.

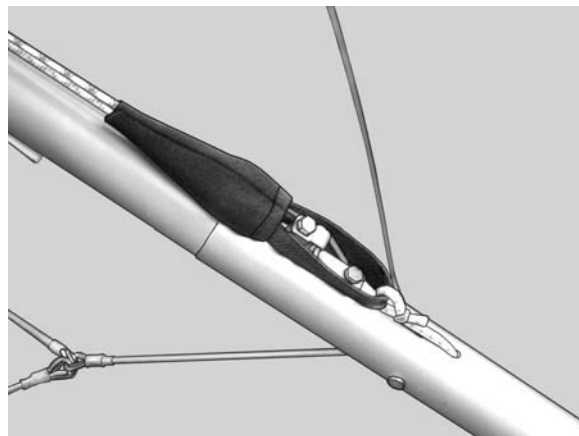


Photo 10

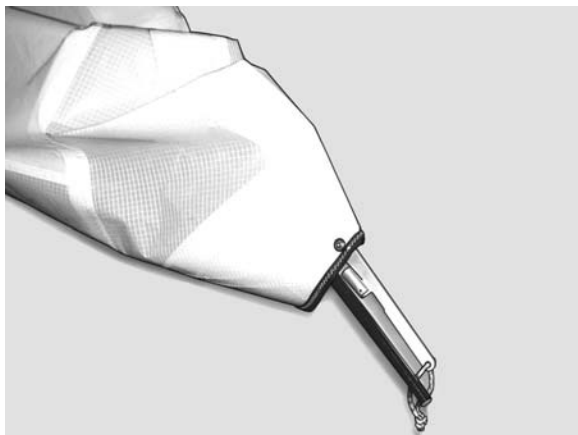


Photo 11

9. The next step is to install the tip wands. The wands are tapered, the larger end is installed in the receptacle in the end of the leading edge tube. Remove the wingtip protector bag. Unfold the tip of the sail and open the tip wand cam lever access Velcro or zipper. Rotate the cam lever outside the sail. Reach into the opening with the tip wand in your hand and work your way up to the end of the leading edge. Install the tip wand into the receptacle, and push it all the way in until it bottoms out (Photo 11).

10. Working from the end of the leading edge, facing the nose, hold the wand in one hand and grasp the tip wand cam lever. Pull aft on the cam lever and stretch the sail to the end of the wand. Fit the cup against the end of the tip wand and pull aft and towards the wand so as to lever the cup onto the wand (Photo 12).



Photo 12

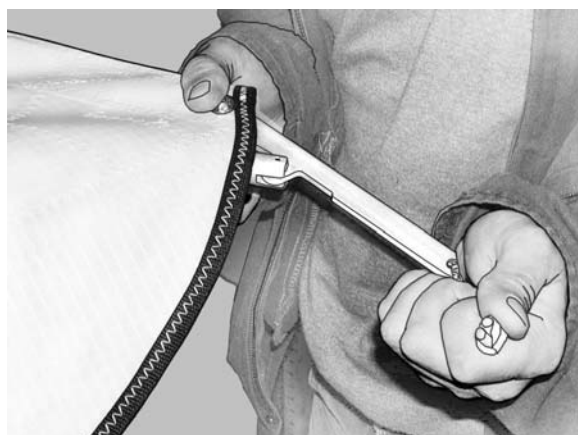


Photo 13

11. Cam over the tip wand cam lever, tensioning the sail at the tip. Holding the end of the leading edge tube in one hand, grasp the cam lever and rotate the tip wand cam lever towards the keel and then towards and against the leading edge. Keep the cam lever parallel to the ground as you cam it over (Photo 13).

Close the cam lever access with Velcro (old models) or zipper (new models) (Photo 14).

12. Install the last four outboard top surface battens. Engage the remaining spring batten tips in the trailing edge at this time.

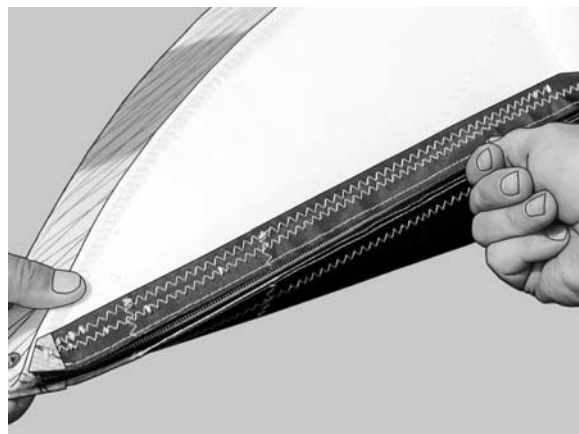


Photo 14



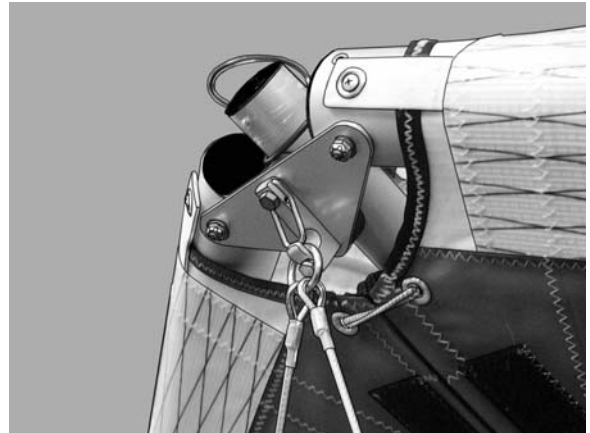
13. The next step is to deploy the outboard sprogs and secure them in position). Before doing so, working through the sprog access zippers, preflight the following items:

- a. Internal ribs to confirm that they are fully zipped up.
- b. The sprog hardware, and the sprog cable attachments at both ends of each sprog cable.

To deploy and secure each sprog, swing the sprog away from the leading edge and align it in the center of the rear end of the sprog access zipper. Fully close the sprog access zipper and this will secure the sprog in the proper position underneath the transverse batten and capture it in position (*Photo 15*).



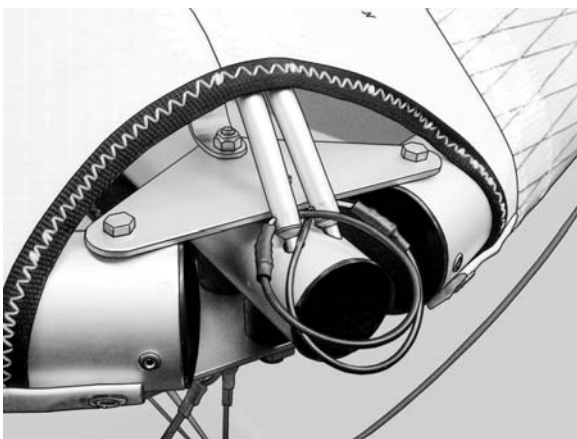
*Photo 15*



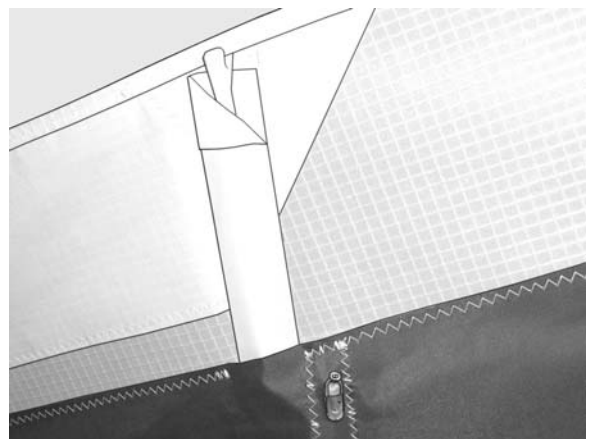
*Photo 16*

14. Attach the bottom front wires to the hook on the bottom nose plate (*Photo 16*).

15. By lifting up and back on the nose batten strings, push the nose battens fully back into the sail so that the tips rest on top of the keel tube (*Photo 17*).



*Photo 17*



*Photo 18*

16. Install the bottom surface battens (*Photo 18*).

17. Zip up the center sail zipper.

18. Install the nosecone, which is connected to the front upper wire.

***Don't fly without the nosecone!***

## PREFLIGHT PROCEDURE

Conduct a complete preflight inspection of the glider, checking all assemblies, which have not already been checked. Every bolt, nut, pin, safety ring, and fastener of any kind should be checked during every pre-flight. A full pre-flight inspection should precede every flight you make, not just the first flight of the day.

Carefully check the entire length of the leading edge pocket to insure that the Mylar insert is lying flat in the pocket. If any section of the Mylar is folded under, de-tension the crossbar, remove the batten closest to the area of distortion, and unfold the Mylar.

### **Along the left leading edge:**

Open the crossbar junction access zipper and look inside, making sure that side wires are properly secured to the crossbar, that the thimbles are not cocked on the tang. Check the split pin and the nut, which secures the leading edge – crossbar junction. Check that the sail is not caught on the crossbar end, or on any of the hardware. Remember to close the access zipper.

**At the left wingtip:** Check that the tip wand lever access velcro is closed.

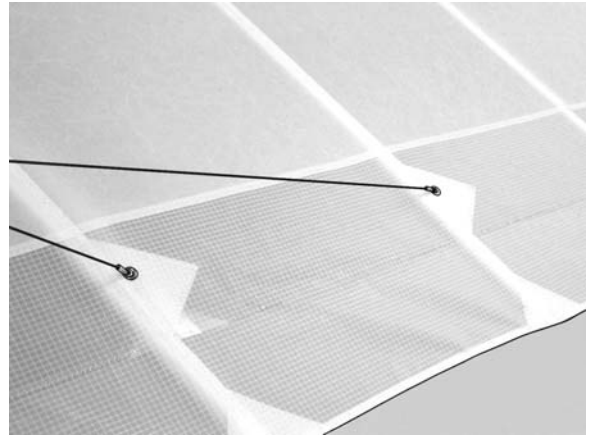
### **Along the trailing edge, left wing:**

Check that there are no tears in the sail material along the trailing edge.

Check that all battens are properly secured.

Check that the outboard sprog is properly secured in position supporting the transverse battens, and that the sprog access zipper is properly closed. With the VG set tight, the sprog paddle slides forward on the transverse batten. Make sure that at VG full tight the rear end of the paddle does not slide past the rear edge of the transverse batten, or the system could malfunction.

Check that the bridles are properly engaged (*Photo 19*).



*Photo 19*

### **From the rear keel:**

Check that the sweep wires are tight and secured on the hook on the keel tube. Check the proper alignment of the VG ropes – they must not be twisted.

Check the nut of the kingpost base bracket, which secures the channel to the keel.

Check the safety ring and the clevis pin, which secures the kingpost to the channel.

Check the safety ring, nut and bolt which secures the hang loop to the kingpost (*Photo 20*).

Check the kingpost top for proper attachment of the bridles and condition of the top rear wire and bridle wires.



*Photo 20*

**Along the trailing edge, right wing:** Same as for the left wing.

**At the right tip:** Same as for the left tip.

**Along the right leading edge:** Same as for the left leading edge.

**Under the glider at the control bar:** Sight down the downtubes, making sure that they are straight.

***Do not fly with bent downtubes!***

Check the cables at the control bar corners, making sure there are no kinks or twisted thimbles. Check for proper installation of all nuts and safety rings at the control bar corners.

Unzip the center zipper.

Check the sweep wire for wear where it passes around the kingpost channel (*Photo 21*).

Check that the routing of all VG ropes and pulleys is clear and straight (*Photo 21*).

Check the VG operation - the pull should be light initially, becoming harder as the VG tight limit is reached. The return on release should be smooth.

With the VG set tight, the sprog paddle slides forward on the transverse batten. Make sure that at VG full tight the rear end of the paddle does not slide past the rear edge of the transverse batten, or the system could malfunction.



*Photo 21*

Check the crossbar center plate's assembly including the sweep wire/X-bar junction and the center bolt.

Also, visually inspect the crossbars by sighting along the length of the crossbars looking for any evidence of damage.

Check the control bar apex bracket hardware, including the clevis pin safeties, the control bar top plug bolt and nut, and the kingpost bracket bolt and nut.

Check the main and backup hangloops, bolt and nut, that they are properly installed in the proper position and that they are in good condition (*Photo 21*).

## LAYING THE GLIDER DOWN FLAT

Once you have the glider set up, it can be laid down flat on the ground.

1. Remove the nose cone from the nose.
2. Release the bottom front wires from the nose hook.
3. Lay the glider down with nose into the wind.
4. Take a keel tube with a hand near the trailing edge and put the keel tube approx. 0.5 m up. Release the sweep wire from the hook on the keel tube to loose a tension of bottom side wires.

Reverse the procedure to set the glider upright again.

## LAUNCHING AND FLYING THE DISCUS

*Before launching, hook in to the glider and do a careful hang check. We recommend that you hang as close to the basebar as possible - this will give you lighter control pressures and better control in both roll and pitch.*

1. If the wind is more than 25 km/h (15 mph) or gusty you should have an assistant on your nose wires on launch, and, if necessary, an assistant on one or both side wires. Make sure all signals are clearly understood. Do a hang check immediately prior to launch. The angle at which you hold the glider should depend on the wind speed and slope of the terrain at launch; you want to achieve a slight positive angle of attack at the start of your run.
2. Run aggressively on launch and ease the bar out for lift off.
3. The flying characteristics of the Discus are typical of a medium performance flex wing. Make your first flights from a familiar site in mellow conditions to give you time to become accustomed to the glider.
4. We recommend that you take-off with VG off.
  - 1.
5. Do not take off if the sail is wet, especially the leading edge, as the stall speed will increase significantly. **Always fly with a dry sail!**
6. For the same reason take special care to avoid ice-covering the glider, particularly the leading edge in wintertime.

**Warning: It is important that you do not take off with VG on more than ½ length of VG rope. The glider with VG more than ½ on becomes easier to stall and the roll response gets longer. With low speed during take off it can lead to unintended stall.**

## SPEED TO FLY

The range of **trim speed** for the Discus with VG off is 33 - 35 km/h (21-22 mph). The speedbar position in front of the pilots face corresponds to this range.

The range of the **stall speed** for the Discus is 29 –30 km/h (18-19 mph). The glider is stable at the beginning of stall. While pushing out the basebar, the bar pressure is progressive.

The Discus speeds up to 80 km/h (50 mph), being essentially roll neutral, with no tendency to yaw. The bar pressure is mild, but progressive and consistent.

With the VG on the trim speed range for the Discus is 33 – 37 km/h (21-23 mph). The basebar position opposite the pilot's neck corresponds to this range. The pitch bar pressure decreases with the VG on. The handling of the Discus with VG on becomes stiffer, but within permitted limits.

## AEROTOWING

**Special care must be taken in any form of towing.**

We recommend that the VG be set to off prior to launch. This provides the best qualitative flight characteristics for flying in formation with the tug at normal aerotow speeds.

**If you choose to launch with some VG on, fix the excess VG rope on the control frame so it will not interfere with the construction of the cart during take off. Make sure that all the harness ropes are hidden inside the harness and will not get tangled on the cart during take off.**

If possible, it is best to adjust the keel cradle on the cart to re-set the glider to the proper angle of attack. For Discus the best angle of the keel tube in relation to horizon is approx. 18 - 20 deg.

If it is not possible to re-adjust the cart, recognize the launch will be more demanding, and more dangerous, as the glider will have an increased tendency to leave the cart at a lower speed, where lateral control is reduced, and the tendency to come off the cart with one wing low is increased. To some degree, this can be compensated for by pulling forward through the control bar to position the basebar below your shoulders, and holding tight to the hold down rope. This will cause the glider to raise the keel as it begins to develop enough lift to lift out of the cart. At that point, and not before that point, you can release the rope and ease your weight aft to fly the glider off of the cart. Be prepared to pull in once clear of the cart if necessary so as not to climb more quickly than the tug.

Once clear of the cart and in the position behind the tug, use firm lateral movements of short duration for roll and directional control in order to stay in the position behind the tug. Do not move to one side of the bar and wait for the glider to respond - this will lead to over control and being out of position, and may lead to roll / yaw oscillations. It is better to "bump" the glider firmly in the direction of the desired correction and then return to center. If you need more correction, bump again. In pitch, stay on top of the situation and be as aggressive as necessary to keep the tug on the horizon.

**Get appropriate training for aerotowing!**

## TRIMMING YOUR GLIDER IN PITCH

You will find that the pitch trim of the Discus, as well as the basebar position at trim, changes with VG setting. At VG loose, the Discus will normally be trimmed closer to stall, than with the VG tight. The bar position at trim at VG loose will be relatively far out. As you set the VG tighter, the trim speed will normally increase and the trim bar position will move back. At tighter VG settings, the amount of pitch pressure felt as you move away from trim also decreases.

At VG loose, the pitch is very well defined, and the pitch force increases quickly as you pull in from trim speed. At tighter VG settings, the "pitch well" becomes more "shallow," and the pitch force increases much less as you pull in from trim speed. Overall pitch trim is affected by several factors. Among the most significant is the location along the keel of your hang point. The farther forward your hang point is, the faster the glider will trim, the less effort will be required to fly fast, and the more effort will be required to fly slow. If the glider's trim is too slow, it will make the glider more difficult to control in roll, especially in turbulent air and when the nose pitches up on entering a strong thermal.

On the Discus, hang loop fore and aft position is adjusted by repositioning the kingpost on the keel.

## USING THE VG SYSTEM

The Discus VG system uses a reduction system of pulleys between the central part of the crossbar and the kingpost channel and also inside the downtube to enable a wide VG range. The change in airframe nose angle from VG loose to tight is over 2 degrees. Tightening the VG increases the spanwise tension which the airframe places on the sail, reducing the spanwise twist and the sail elasticity. The result is an increase in L/D performance and a reduction in roll control authority and roll control response.

The VG is activated by pulling laterally on the VG rope and then moving the rope to set the rope in the cleat. The recommended procedure for increasing VG tension is to grasp the rope firmly at the cleat, and pull along the basebar.

VG full loose is for maximizing roll control authority and roll rate.

Between VG full loose and VG one half, the glider retains good lateral control authority and response.

Tighter than VG one half, the glider's roll pressures increase significantly and the roll rate becomes significantly slower. Tighter VG settings are recommended for straight line gliding, or for flying in smoother conditions when well clear of both the terrain and of other gliders. The stall characteristics of the Discus at tighter VG settings are more abrupt and less forgiving and the glider is more susceptible to spinning. Full breaking stalls and accelerated stalls at tighter VG settings are not recommended.

## LANDING THE DISCUS

Under ideal conditions, landing approaches are best done so as to include a long straight final into the wind at a speed above best L/D speed. In a very limited field, or a field which slopes slightly downhill, when landing in light wind, you may need to make your final approach at a slower speed, perhaps as slow as minimum sink, in order to be able to land within the field.

In winds of less than 5 km/h (3 mph), if the landing area slopes downhill at more than 10:1, you should seriously consider landing downwind and uphill; or crosswind, across the slope. Landing attempts, which require slow speed approaches, maneuvering around obstacles or into a restricted area, or downwind or crosswind landings are not recommended for pilots below an advanced skill level.



*Photo 21*

We recommend that you make your approach with the VG set between full loose and 1/3 on. A full loose VG setting will reduce glide performance, making it easier to land on a target or within a small field. It will also ensure maximum control authority during the approach, and especially when flying very slowly on final. At VG full loose, however, there is some loss of aerodynamic efficiency and flare authority. For this reason, in very light winds, at higher wing loadings or at higher density altitudes, it is recommended that a setting of VG 1/4 be used. A full loose VG setting will also increase the glider's roll sensitivity, and some pilots have had difficulty with roll / yaw oscillations on final. The best way to avoid this is to fly your entire approach at a constant airspeed, and to control your touchdown point by making adjustments to the shape of your pattern. You should choose your approach speed based on the amount of wind and turbulence present - in stronger wind and more turbulent air, fly faster. In any case, however, try to fly a constant airspeed throughout the approach.

Once established on a straight final approach, with wings level and flying directly into the wind, you should fly the glider down to where the basebar is about 1 m (3 ft) off the ground. At this altitude, let the control bar out just enough to "round out" so that your descent is arrested and your flight path parallels the ground. The remainder of your approach will consist of bleeding off excess speed while paralleling the ground and keeping the wings level and the nose pointed in your direction of flight until it is time to "flare" for landing.

Prior to the landing flare your body position should be generally upright, but slightly inclined forward, with your head and shoulders forward of your hips and your legs and feet trailing slightly behind (*Photo 21*). Many pilots make the mistake of trying to get too upright at this stage of the landing, which actually reduces your flare authority and makes it harder to land on your feet. Your hands should be at shoulder width and shoulder height on the uprights.

You should be relaxed, with a light grip on the bar, and your weight should be fully supported in your harness and not at all by your arms. (If your harness does not allow you to hang in the proper semi-upright landing position "hands off," without supporting your weight on the control bar, you will have a lot more difficulty making good landings.

## DISCUS BREAKDOWN

Breakdown of the glider is the reverse of assembly.

1. Start with the VG set full loose. Remove the nosecone. Remove any instruments.
2. Detach the bottom front wires at the noseplate.
3. Unzip the sprog access zippers all the way to the leading edge end of the zippers and put out the outboard sprogs.
4. Remove the four shortest cambered battens and the bottom surface battens.
5. Open the tip wand cam lever access velcro, and pull on the string attached to the end of the lever to "un-cam" the lever and straighten the tip wand (*Photo 22*).



Photo 22



Photo 23

Holding the tip wand in one hand, pull straight aft on the cam lever and disengage the cup from the end of the wand. Remove the tip wand by pulling straight aft from the end of the leading edge (*Photo 23*). Rotate the lever inside the sail and close the access velcro. Install the tip bag of the sail at this time.

6. Remove the remaining top surface battens.
7. De-tension the crossbar sweep wire and let the wings fold in slightly. Detach the bridle ring from the kingpost snap hook.
8. Fold the wings all the way in to the keel pulling the sail over the top of the leading edges. At each wingtip, remove the tip cover bag. Lay the kingpost down forward against the keel (*Photo 24*). At this time you should be able to dismount the front ends of the nose battens from the keel tube. Install the protective pad and sock over the rear wire junction bolt and the rear end of the keel.

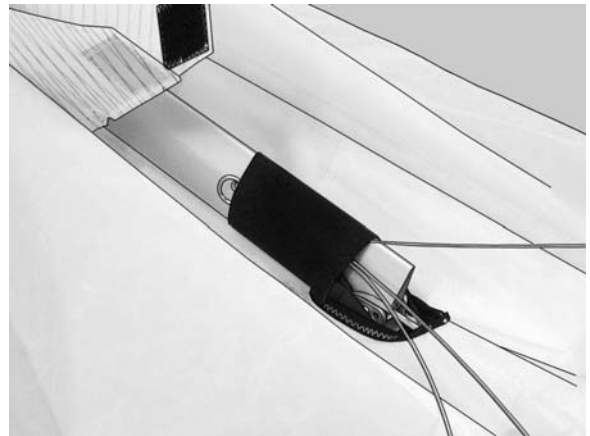


Photo 24



Photo 25

9. Fold the outboard sprogs against the leading edge towards the tip. Make sure the sprog zippers are fully open.

10. Pull the sail out away from the keel until it is even on top and bottom. Roll the sail gently and carefully, parallel to the trailing edge of the front and then outboard portion of the sail (*Photo 25*).

*Try to roll the sail in such a way that the leading edge portion remains as smooth as possible. Do not attempt to stuff the sail between the Mylar pocket and the leading edge tube at any point where you feel resistance, and do not attach the velcro ties so tight so as to induce creases in the Mylar or leading edge sail material.*

11. At the wingtips, lay the sail at the tip out flat, and fold the wingtip forward over onto the bottom surface of the sail (Photo 26).

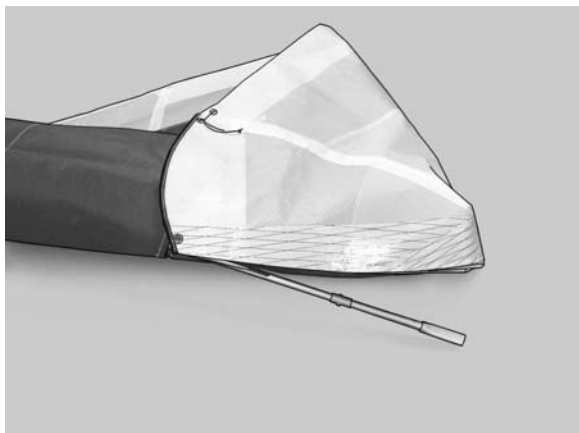


Photo 26



Photo 27

Working from the trailing edge, roll the sail tightly to the leading edge (Photo 27), and install the tip cover bag.

**Note:** If you're breaking down in a dirty, rocky and/or abrasive area, you can combine this step with step 7 above, by pivoting the wing inwards enough to allow you to flip the sail at the tip over the top of the leading edge, fold forward and roll up the wing tip and put it in the tip cover bag.

12. Finish rolling the sail in the area of the sprogs. Secure the sail with the velcro sail ties. The first velcro tie is installed by passing it over the top of the keel tube just near the Crossbar-LE tube junctions, and then installing it around the glider leading edges (Photo 28).



Photo 28



Photo 29

13. Install the sail velcro around the sail forward of the control bar apex, and stow the nosecone between the leading edges (Photo 29, 30).

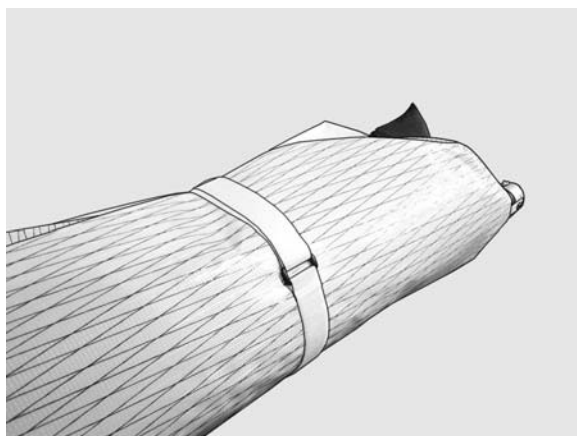


Photo 30

14. Install the glider bag. Flip the glider over onto the ground. Detach the basebar. Put the battens and the tip wands in the batten bag and stow it in the rear of the glider between the leading edges, same as basebar (*Photo 31*).

15. Fold up the control bar and install the control bar bag, lay it down against the keel. Undo the velcro, which was done first, reach it out to free the keel tube and install it again around both leading edges with the control bar inside (*Photo 31*).

16. Zip up the glider bag.



*Photo 31*

## **DISCUS STABILITY SYSTEMS**

Several design features of the Discus determine the glider's degree of stability in pitch:

- The combination of wing sweep and spanwise twist.
- Reflex in the root section.
- Reflex support bridles.
- Outboard sprogs, and the height at which they and the transverse battens support the trailing edge.
- The shape of the preformed battens and the internal fabric ribs, and adjustment of the internal velcro attachments, which define the airfoil.
- The setting of the tip wands.

Correct attachment and proper adjustment of the outboard sprogs are critical to providing adequate stability at low angles of attack, particularly those below the normal operating range.



## DISCUS SPROG ADJUSTMENT AND FLIGHT TESTING

The Discus uses outboard sprogs in combination with one transverse batten on each sprog. Each transverse batten spans two top surface battens, so a total of four top surface battens are supported. The sprog system is the primary component of the system, which provides pitch stability.

The function of the system is to support the trailing edge of the sail at low angles of attack, and thus provide a nose up pitching moment. The sprogs are adjusted at the factory to their proper settings.

You can check this adjustment as follows:

### SPROG MEASUREMENT

1. Fully set up glider on a reasonably level surface and set the **VG to full tight**.
2. Place three equal supports, about 1,7 m (5.5 ft) tall, under the each leading edge tube-cross tube junction and in place behind the connection of rear bottom cables to a keel tube.
3. Tie a lightweight string tightly across the wing from the inner of the two supported battens on each sprog to the corresponding batten on the other wing.
4. Press firmly on the end of each sprog supported batten and then release. Set the VG to full off and than to full tight again. Measure the height of each thread relative to the top of the keel tube. The results should be as follows:

Batten # - #	Discus 125, mm	Batten # - #	Discus 138, mm	Discus 148, mm	Discus 155, mm
6 - 6	30	7 - 7	60	65	40
7 - 7	40	8 - 8	70	85	50

**Note: All figures are given with VG on only. Permissible range of thread heights relatively to the top level of the keel tube is +/- 5 mm.**

5. Note that this method will not disclose sprogs that are asymmetric. If, after achieving the proper measurement, you have a turn in the glider, which is only present at tighter VG settings, lower the sprog on the side the glider is turning towards, and raise the other sprog by the same amount.

### METHOD OF ADJUSTMENT

1. To adjust the sprog height, fully unzip the access zipper to gain access to the sprog-LE tube connection (*Photo 32*).
2. Remove the sprog wire tang from the pin on the LE tube, taking care to maintain the rotational alignment of the sprog at its original setting.
3. At the front of the sprog there is a threaded adjuster. To raise the sprog, turn the entire sprog counter clockwise. To lower the sprog, turn it clockwise. One full turn raises or lowers the sprog end about 12 mm (1/2").
4. Re-attach the sprog cable and press down firmly on the rear end of the sprog to seat the cable before checking the measurement again.



*Photo 32*

### TEST FLIGHT

If the sprogs are set too low, it may cause a significant increase in trim speed and a reduction in pitch pressures at tighter VG settings, and there will be a reduction in pitch stability at angles of attack below normal flight angles. This stability reduction could increase the probability of a turbulence-induced tumble or other in-flight stability related loss of control. If the sprogs are set too high, it may cause excessive pitch bar pressure at high speeds, and excessive roll control pressures, lag in roll response.

Please be aware that flight-testing encompasses a very limited angle of attack range and that there is no correlation between pitch stability in the flight test envelope and pitch stability in the extended angle of attack range that is investigated on a test vehicle.

*This test is best performed by a qualified test pilot, and, in any case, should be performed only in smooth air and with caution.*

## MAINTENANCE

This section contains a recommended schedule of periodic maintenance. None of the items in this section are a substitute for the continual and consistent practice of proper pre-flight inspections and immediate maintenance of any items on the glider, which require it. Safety requires that your glider be fully airworthy for every flight. Nuts and bolts must always be secure, safeties must always be in place, and damage to any part, which could compromise the airworthiness of the glider, cannot be tolerated. If you have a question about the need to repair or replace some part of your glider, feel free to contact your dealer or Aeros directly. It is not always obvious which items require attention and which may not. Minor dents or dings in a non-critical location on an airframe tube may not require any repair or maintenance. On the other hand, a wire that has been kinked one time can fail very quickly after that, and should be replaced immediately.

We recommend that you have all maintenance work done by your Aeros dealer.

### EVERY SIX MONTHS

1. Check the adjustment of your outboard sprogs, as described in the last section.
2. Check your battens on a flat level floor against the batten diagram provided, and correct any that deviate from the pattern by more than 6 mm (1/4").
3. If you fly in a dusty or sandy environment, it will help to prolong the life of your batten pockets if you wipe each batten with a rag before you install it in the sail.
4. Have a complete inspection performed on the glider and replace any suspension system component that shows any wear, and any cable that shows any kinks, wear, damage, corrosion, etc.
5. Inspect all bolts for tightness, all safeties for proper installation and possible damage. Inspect plates and fittings for damage, holes in tubes for elongation.
6. Inspect the sail for wear, tears, UV damage, loose stitching, etc.
7. Disassemble basebar pulley assembly, clean, lubricate with white grease, and re-assemble.
8. Lightly spray all zippers on the glider with silicone spray lubricant. Also spray your battens before you install them in the glider to lubricate the insides of the batten pockets. Do not use any other type of lubricant. Wipe off any excess silicone so that it does not attract dirt.
9. Inspect the sprogs, sprog hardware and sprog cables. If the sprogs have been loaded heavily, it is possible that the sprog tubes may have been bent, and the cables may have been stretched.

### EVERY YEAR

In addition to the normal six month service items, also perform the following:

1. Have the sail completely removed from the frame, and disassemble all frame components. Inspect every part of the glider for any damage or wear. Inspect the tubes for straightness and for signs of corrosion. Note that the rear leading edge is secured in the front leading edge by two eccentric reducers. As a result, the rear leading edge is at an angle to the front leading edge and the leading edge as an assembly will appear to be slightly bent out and up at the junction. This is normal and by design.
2. Anytime you have the sail off the frame, turn the sail inside out through the bottom surface center zipper and inspect all of the batten pockets and batten pocket terminations.
3. Replace bottom side wires and hang loops.
4. Replace the VG ropes.
5. Remove the transverse battens and inspect for damage.

## **SPECIAL CIRCUMSTANCES**

1. Any time you suffer a crash or extremely hard landing you should have an "annual" inspection done on your glider to insure that you find all damaged parts. Following any hard landing be sure to inspect the apex hardware, the control bar legs and basebar, and all control bar fittings for damage. Any time you replace a control bar leg or basebar, you must carefully inspect all related fittings and replace any that are bent or damaged.

Hard landings may also impose very high loads on the sprog assemblies and transverse battens, and bridle lines. Inspect accordingly.

2. If your glider is ever exposed to salt water you will need to have the glider completely disassembled in accordance with the recommended annual inspection procedure. All frame parts will need to be disassembled, including the removal of all sleeves and bushings, flushed liberally with fresh water, dried completely.

3. A wet glider must be dried before storing. Do not leave your glider wet for more than one day, because corrosion may result.

4. Take special care to avoid ice-covering the glider, particularly the leading edge in wintertime.

5. If you fly regularly at the coast in windy conditions, be aware that the sea mist spray can have the same effect. Hose down your glider after such flights, and keep a special lookout for corrosion.

6. Cleaning Your Sail - Keeping your sail clean will extend the life of the cloth. When cleaning the entire sail you should generally use only water and a soft brush. You may clean small spots or stains with any commercial spot remover that is labeled for use on polyester.

## **A NOTE ABOUT CABLES AND CABLE MAINTENANCE**

The cables which support the glider's airframe are critical components of the glider's structure, and must be maintained in an air worthy condition. It is a general practice in the design of aircraft structures to design to an ultimate strength of 1.5 times the highest expected load in normal service.

Hang glider cables, like other structural components on the glider, are typically designed with a structural safety factor of only about 50% above the expected maximum load. No significant loss in cable strength can be tolerated.

A cable with even a single broken strand must be replaced before the glider is flown again. A cable which has been bent sharply enough to have taken a permanent set must also be replaced immediately.

Some degree of fatigue due to repeated bending of cables is almost unavoidable in an aircraft that is assembled and disassembled with every flight. Bottom side wires are subject to the highest loads in flight, and are therefore the most critical. This is why we recommend that these wires be replaced annually, even if there is no known damage.

## **TIP WANDS MAINTENANCE**

Although we use the most expensive and the best available fiberglass material for the tip wands, these wands are not indestructible. Proper use of Aeros tip wands can greatly extend the service life of the wands.

There are a few important things to remember to extend the service life of the tip wands:

-try to avoid landing on a wing tip, the tip wand can easily get damage or brake by forceful contact with the ground;

-always install the tip wands with the same side facing forward for each flight. If the tip wands are not marked, mark them near the end with indelible marker. This will tell you which side is the back side of the wand and which side is the front side;

-inspect the tip wands regularly and replace when replacement is indicated.

## REMOVING THE SAIL FROM THE AIRFRAME AND RE-INSTALLING

Many maintenance and repair procedures will require the removal of the sail from the frame. Please follow these instructions when removing and reinstalling the sail. Please read all the instructions for each operation before beginning.

### SAIL REMOVAL

You will need an unobstructed area 2 m by 9 m (6x30 ft). Make sure the surface is clean. If it is abrasive, you should either put down a protective tarp or be extremely careful not to scrape your sail.

1. Lay the glider on its back, unzip and remove the glider bag and put the battens aside. Remove the control bar bag.
2. Spread the wings slightly. Dismount the sail from the rear leading edges by removing the clevis pin located 100 mm (4") forward of the rear of the leading edge tube. Remove the pin from the sail anchor strap and re-install it in the leading edge.
3. Remove the screws that tether the nose part of the sail at the leading edge tube and keel pocket at the rear part of the keel tube. Remove the rope zipper stop at the bottom nose area. Completely unzip and separate the bottom surface zipper. Unbolt the upper front wire from the noseplate and feed it through the hole and out of the sail.
4. Remove the rear leading edges (see the section on "Breaking Down The Rear Leading Edges" at the beginning of this manual).
5. Unbolt the bottom and upper side wires from the crossbar and feed them through the holes and out of the sail. Detach the bottom and upper rear flying wires from the rear keel.
6. Unbolt the hang loop from the kingpost. Detach the kingpost from the keel tube channel.  
*Reassemble the hardware removed onto the bolts in the original order so that it doesn't get lost. All disassembled assemblies on the glider must be reassembled in the proper order and orientation.*
7. Slide the frame out through the open center zipper. If you encounter resistance, stop and find out what is hanging up.
8. If you need to send the sail in to the factory for repair, remove the Mylar and the transverse battens. The Mylar is removed from the front end of the Mylar pocket. It helps to secure the opposite end of the sail to something solid, so that you can lay the leading edge out straight and pull the Mylar straight out of the pocket.
9. Fold and package the sail carefully if you plan to ship it in for repair. Be sure to include written instructions of what you want done, your name and a phone number.

### RE-INSTALLING THE SAIL ON THE FRAME

1. Install the Mylar in the sail. Make sure you install it right side up; the slit edge is at the front and on the bottom. The easiest way to install the Mylar is to push it into the pocket using a long lofting batten attached to the end of the Mylar insert, which is first inserted in the pocket.  
You will have to stop from time to time to make sure the Mylar is properly lying flat in the pocket. Do not push the Mylar too far into the pocket. Make sure there are no folds in the Mylar, especially at the tips. Make sure the Mylar wraps in the proper direction to follow the sail around the leading edge as it enters the pocket.
2. Install the transverse battens in the sail.
3. Position the sail on the floor with the keel pocket up and the wings folded over so that the leading edges lie along the length of the root line, with the Mylar pockets lying on top.
4. The frame is most easily inserted without the rear leading edges installed.
5. Position the frame with the bottom of the noseplate facing up and with the rear end of the leading edges at the nose of the sail. Slide the frame into the sail through the open bottom surface zipper, making sure that the leading edges of the frame pass properly into the leading edge pockets of the sail and don't get caught at the rear of the bottom surface near the root. As you feed the frame slowly into the sail, check periodically to see that none of the hardware is snagging on the sail or internal sail ribs.
6. Install the rear leading edges (see the section on re-installing the rear leading edges after shipping at the beginning of this manual.)

7. Mount the sail mount webbing anchor straps at the front leading edge tubes and sail retainer webbing strap to the keel tube with screws.

8. Reconnect the bottom surface center zipper at the nose, zip part way up, and install a securing zip rope at the nose.

9. After the frame is fully installed, mount the webbing anchor strap to the rear leading edge with the clevis pin located 100 mm (4") from the end of the leading edge. Make sure the strap is properly oriented on the bottom of the leading edge tube (which is on top with the glider upside down) and that the strap is not wrapped around the tube. (See the section at the beginning of the manual about re-assembly after shipping.)

10. Flip the glider. Attach the kingpost to the keel tube channel. Check that the routing of the sweep wire and all VG ropes around the kingpost channel are right and clear.

11. Working through the crossbar junction zippers, insert the bottom and upper side wires into the sail and attach to the crossbar, making sure that no cable is wrapped around a leading edge or crossbar, and that no thimbles are cocked or twisted.

12. Insert the upper front wire into the sail and attach to the nose plate. Don't forget to thread this wire through the nosecone hole.

13. Attach the bottom and upper rear wires to the rear of the keel.

14. Set the glider up onto the control bar.

15. Spread the wings slowly and carefully, making sure that the sail rides forward as necessary at the nose without catching.

***Be careful: you can easily tear the sail open at the nose at this point.***

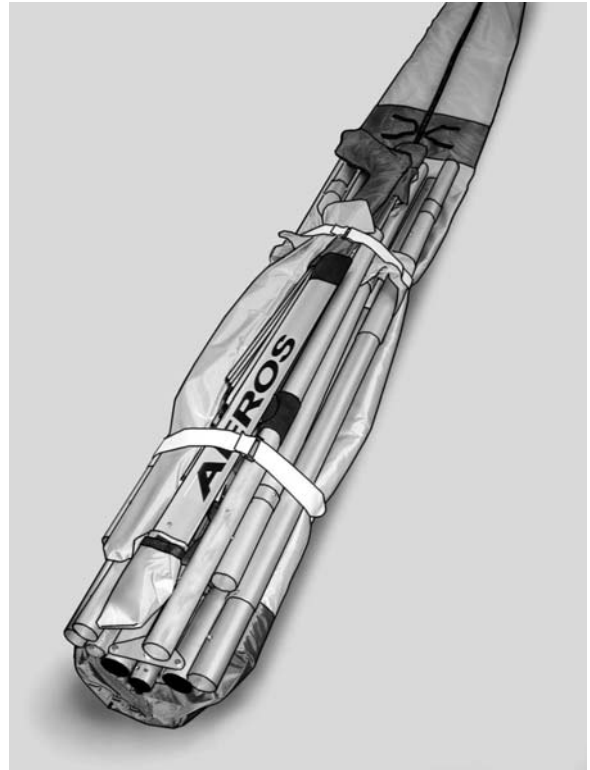
16. Bolt the hangloop tangs to the kingpost.

17. Finish the assembly of the glider completely according to normal assembly procedures.

18. Do a very careful and complete preflight of the glider according to the normal preflight procedure as explained earlier in this manual.

## DISCUS REASSEMBLY AFTER SHIPPING IN TWO METERS LONG PACKAGE (Discus B model only)

1. Lay the glider down on a smooth, clean work surface. Remove the two meters glider bag. Unfold the six meters glider bag with the sail to its full length and get the frame out (*Photo 33*).

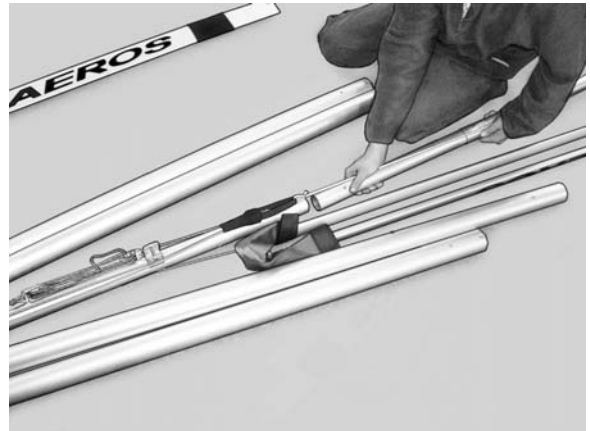


*Photo 33*

2. Sort all tubes out and do careful check, ensuring that neither tubes nor cables have been damaged during transportation (*Photo 34*).



*Photo 34*



*Photo 35*

Insert the rear keel / middle keel tube assembly into the front keel tube, rotating as necessary, until the button spring in the middle keel engages securely into the holes in the front keel (*Photo 35*).

Make sure the sweep wire passes the kingpost channel from its left, the routing of all VG ropes and pulleys is clear and straight, and the shackle rubber cord is not twisted around the keel tube.

3. Identify the middle leading edge / rear crossbar tubes assembly as to left and right in order to make sure you are mounting the correct middle leading edge into correct front.

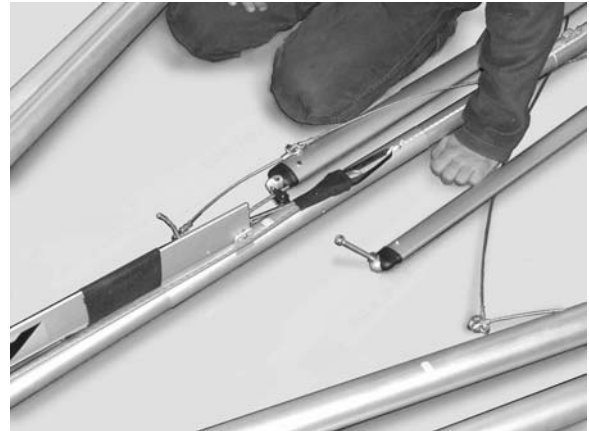
Identify the crossbar tubes as to left and right in order to make sure you are mounting the correct rear crossbar tube into correct front.

Check the "right" / "left" marking on the leading edge tubes and crossbar tubes – they must be on top.

Insert the middle leading edge into the front leading edge and at the same time insert the rear crossbar into the front crossbar (*Photo 36*). Make sure the button springs in the leading edges and crossbars are fully engaged into respective holes.



*Photo 36*



*Photo 37*

4. Remove protection bags from top and bottom of the control bar. Unroll the cables set; identify front and rear cables, side cables left and right. Examine them carefully. Make sure the cables are not twisted or kinked, and that they have no broken strands (*Photo 37*).

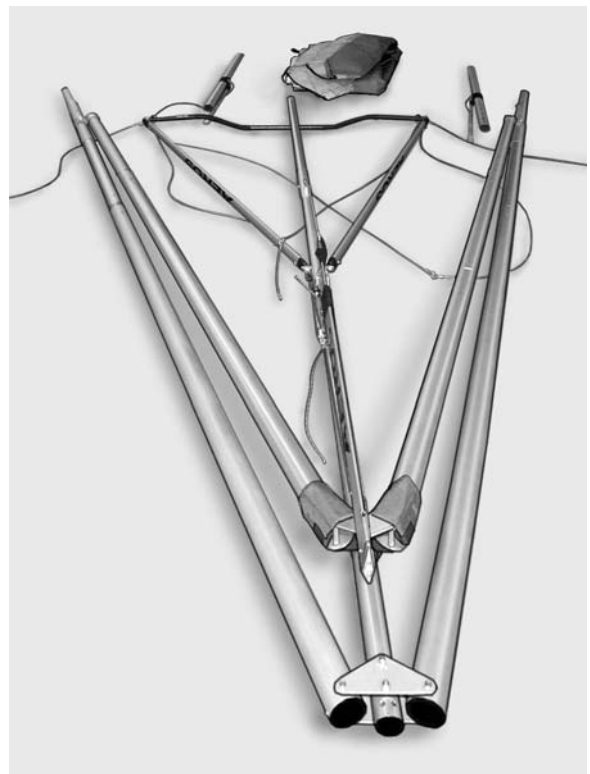
Using 8 mm socket wrench and a flat head screwdriver or two flat head screwdrivers attach the upper control bar fittings to the keel with a bolt and a safety nut. Secure the assembly with a safety ring.

5. Spread out the control bar legs.

Remove the quick pin from the corner bracket. Insert the corner bracket all the way into the basebar, positioning the basebar so that the off-set of the basebar is directed forward in the direction of flight (it has to be directed down in our case).

Install the quick pin bolt (from front to rear), securing the bracket to the basebar. Pass the VG rope through the clam cleat.

6. At this stage the Discus reassembly from two meters long package is finished and the frame is ready for installing the sail (*Photo 38*).



*Photo 38*

To put the sail on the frame refer to the section "Reinstalling the sail on the frame " above.

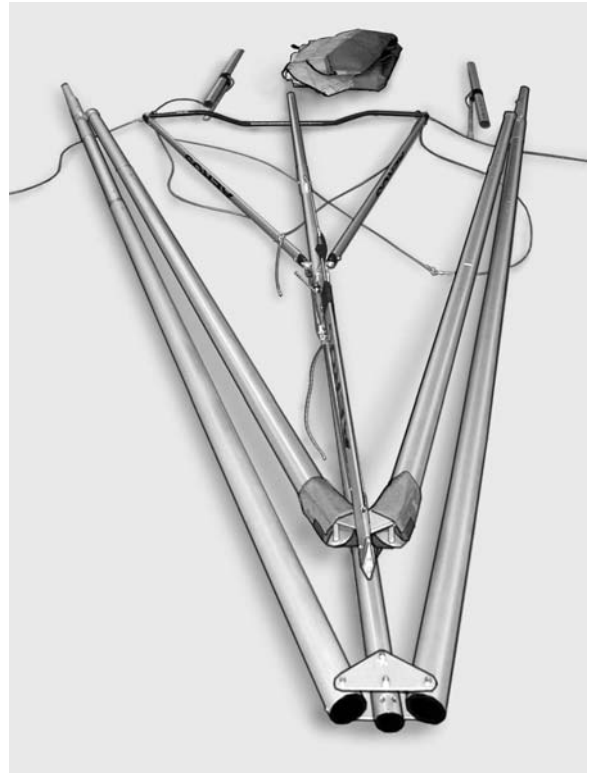
## DISCUS BREAKDOWN FOR SHIPPING IN TWO METERS LONG PACKAGE (Discus B model only)

Discus breakdown in two meters long package is basically the reverse of Discus reassembly from two meters long package.

Refer to the pictures in the section above if necessary.

After the sail has been removed from the frame (see the section "Removing the sail from the frame and re-installing") and rear leading edges have been unplugged, proceed to the following steps.

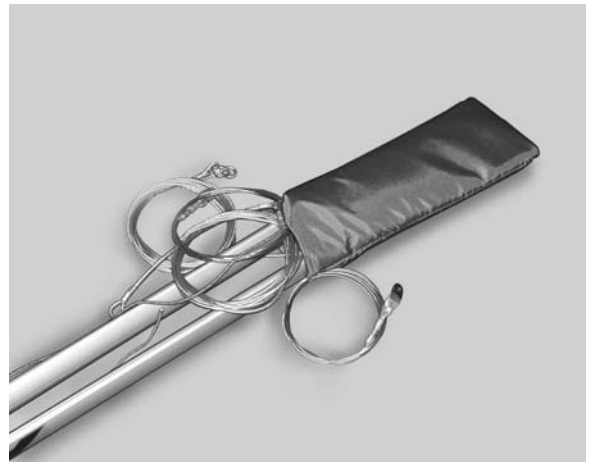
1. Lay the frame on a floor or on a clean working surface as shown on the picture (*Photo 39*).



*Photo 39*



*Photo 40*



*Photo 41*

2. Detach the basebar and fold up the control bar legs. Dismount the control bar apex assembly. Install the protection bag on the control bar upper fittings (*Photo 40*).

Carefully roll the bottom and top cables and install the protection bag on the control bar bottom fittings (*Photo 41*).

3. Remove the middle leading edge / rear crossbar tubes assembly from the front leading edges and at the same time from the front crossbar.

4. Remove the rear keel / middle keel tube assembly from the front keel.



5. Carefully fold the sail in halves, folding the top surface of one wing to the top surface of another wing. Fold the sail along the leading edge (Photos 42-44).



Photo 42

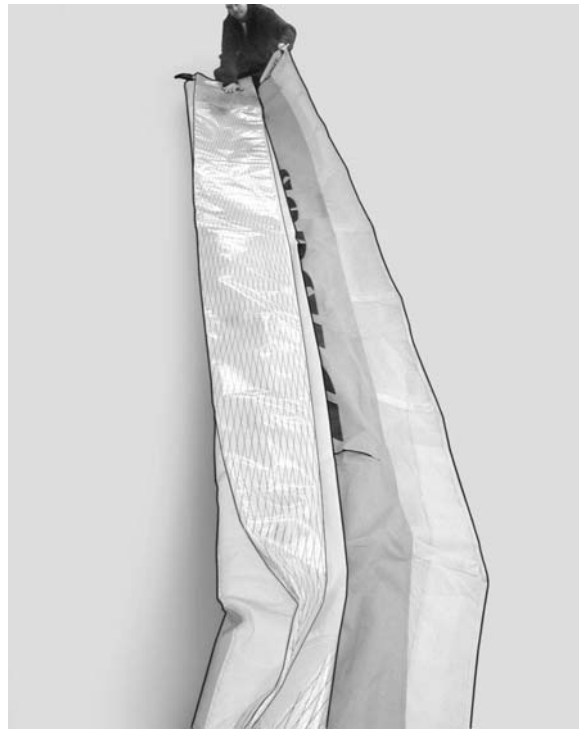


Photo 43

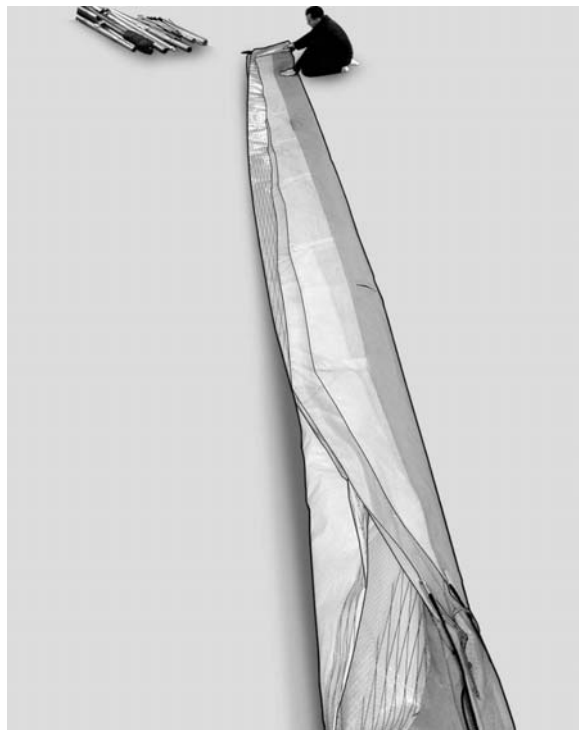


Photo 44



Photo 45

Put the sail into the 6 meters glider bag and zip the glider bag up (Photo 45).

6. Put two velcro ties under the glider bag with the sail.

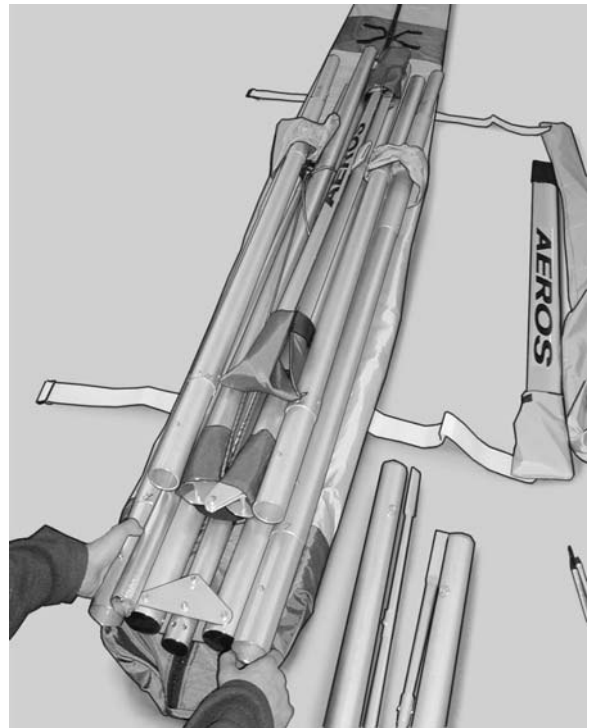
Carefully pack up the frame on top of the glider bag with the sail.

Put down the front leading edges / keel / front crossbar assembly first.

Slide the front crossbar forward to align its rear part with the rear part of the front leading edges.

Bring forward the rear keel / middle keel assembly and put it beside.

Put the rest of the frame parts on top, using pieces of soft foam as pads in places that stick out, in order to protect the frame parts from damage (*Photo 46*).



*Photo 46*

7. Fold the glider bag with the sail. Before doing so put some pads to avoid the sail damage from contact with the end surface of the frame (*Photo 47*).



*Photo 47*

8. Tie up the glider package with remaining velcro ties (*Photo 48*).



*Photo 48*

11. Put the glider into the 2 meters glider bag and tie up the glider bag from its end surface (*Photo 49*).



*Photo 49*

**The glider is ready for shipping** (*Photos 50-51*).



*Photo 50*



*Photo 51*

## GLIDER TUNING

### CG ADJUSTMENT

This has already been covered in the section of this manual –“Trimming Your Glider in Pitch”.

### TURN TRIM

Turns are caused by an asymmetry in the glider. If you have a turn, first try to make the glider symmetrical in every way. If a turn only appears at VG settings of 3/4 to full tight, it may be an indication that the outboard sprogs are set asymmetrically.

### AIRFRAME

Check the leading edges for possible bent tubes. Check that the keel is not bent to one side.

Check for symmetrical twist in the leading edges by checking for symmetry in the alignment of tip wand receptacles.

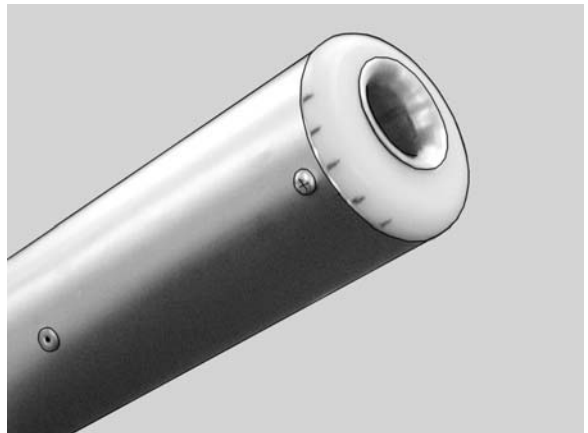
### BATTENS

Check the battens for symmetrical shape.

### TIP WAND RECEPTACLES - ROTATIONAL ALIGNMENT

The plastic plug, which fits directly into the rear leading edge, determines the rotational alignment of the tip wand. This plug is secured against rotation by a small screw in the end of the leading edge.

There are five holes in the plastic cap, allowing for two notches of rotational adjustment on either side of the normal, center hole (*Photo 52*). Prior to removing the securing screw, first use a sharp knife or another object to scribe a reference line across both the very end of the leading edge and the edge of the plastic cap. This will mark your starting point. Remove the securing screw and rotate the cap to see where in the five-hole range of adjustment the cap has been initially set.



*Photo 52*

### SAIL TENSION

Check for symmetrical sail tension on the leading edges. In order to check this, sight the hem of the sail at the bottom of the leading edge tube relative to the nose plate on each side. Leading edge sail tension is adjusted by changing the tip wand cam lever position from one hole to another (see schemes DSC...040.000.AD, ZONEXI). This method is used to correct the significant turn of the glider.

### TWISTING A TIP

After you have made everything symmetrical, if you still have a turn, you can correct it by rotating one or both tip wand receptacle end caps. A left turn is corrected by twisting the left sail plug counter clockwise (twisting the sail down at the trailing edge) or twisting the right sail plug counter clockwise (twisting the sail up at the trailing edge) or both. Twist clockwise on either or both plugs to correct a right turn.

The method of twisting a tip wand is used to correct the minor turn or as an additional method when after changing the tip wand cam lever position the glider still has a turn.

### BATTEN TENSION

The two outboard most battens are tensioned by looping the batten string over the notched end of the batten twice. The remaining battens are all fitted with spring tips. The outboard batten with strings should be adjusted quite tight for maximum sail cleanliness. The spring batten tips will automatically set their own proper tension if they are the correct overall length. With the lever type batten tips you have to adjust the sail tension according to the air humidity.

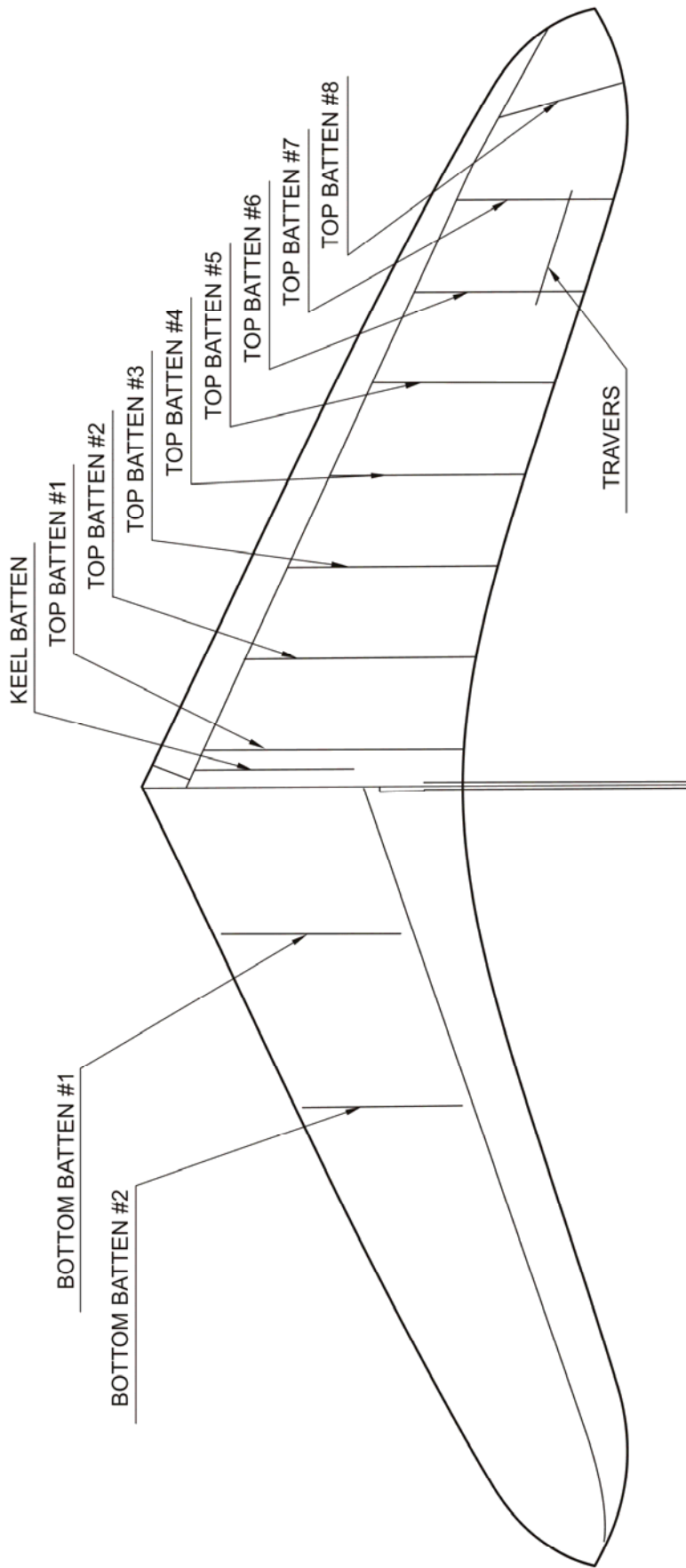
## IN CLOSING - A FEW FINAL WORDS ON YOUR SAFETY

- Hang gliding is an active air sport with associated risks. Your safety can be greatly enhanced by following a few simple rules:
- Your glider is delivered to you ready to fly. Do not make any adjustments, which are not described in this manual.
- If you are in doubt about any aspect of your glider, you should consult your dealer or Aeros for advice.
- Only fly after having attended a good school, recognized by your hang gliding federation.
- Fly a glider suited to your level of ability. A new risk may arise when you first fly a new type of the glider.
- The reactions of your new glider may well differ from those of the glider you where used to. In order to keep this risk low, we recommend that you gradually become familiar with your new glider.
- Before every take-off always do both an assembly check and a pre-flight check.
- Do not take off if the sail is wet, especially the leading edge, as the stall speed will increase significantly.
- ***Always fly with a dry sail!***
- A wet glider must be dried before storing. Do not leave your glider wet for more than one day, because corrosion may result.
- Never fly alone.
- Do not attempt towing of any kind, unless you have attended a recognized towing school.
- Don't push your luck. It is your responsibility to know the limits of your glider and the limits of your own experience. Remember, that ultimately your safety is your responsibility.
- Fly only in places, which are suitable for hang gliding.
- With proper care and maintenance, your glider will retain a high level of airworthiness for many years.

Have fun. Fly safely.  
Aeros Team

## **S C H E M E S**





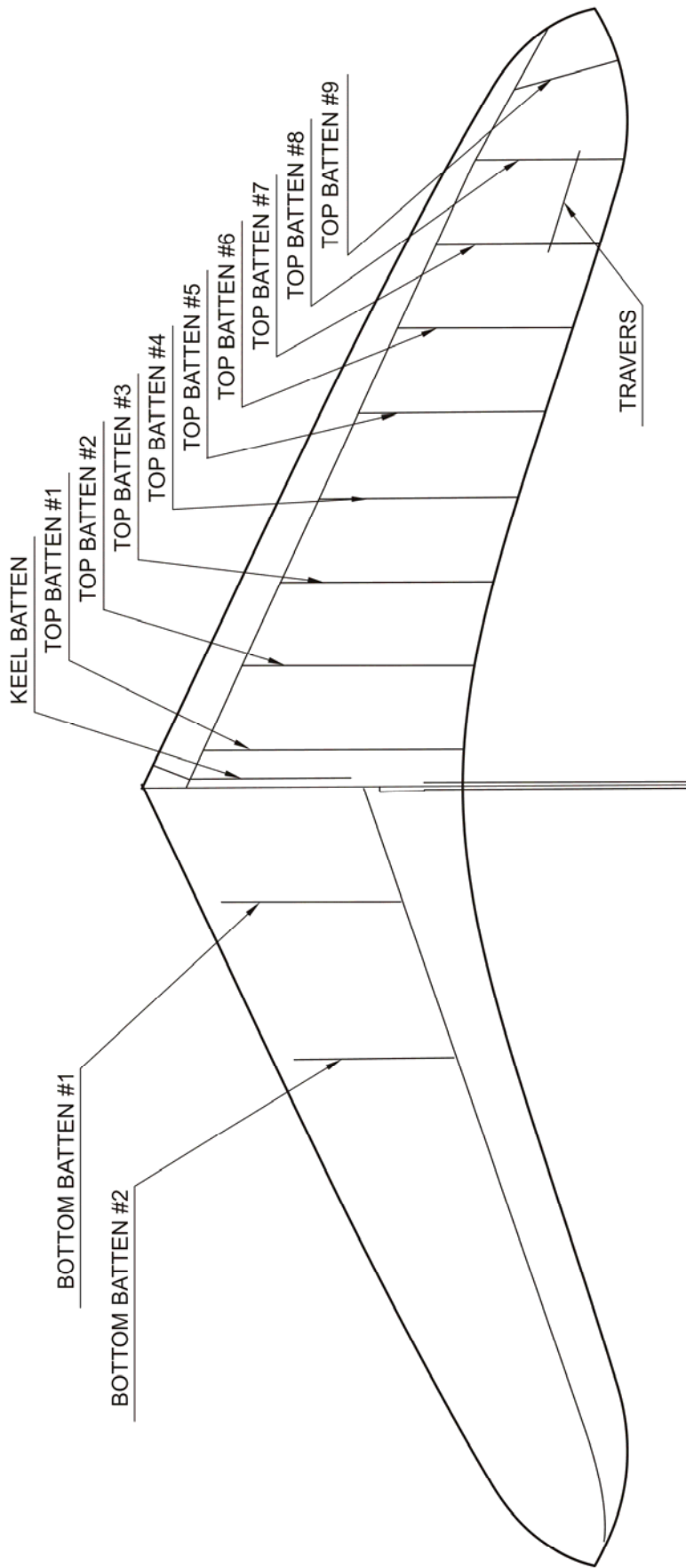
**AEROS**

DSC...010.000.AD  
BATTENS

**DISCUS12A,  
DISCUS12B**

Scale:



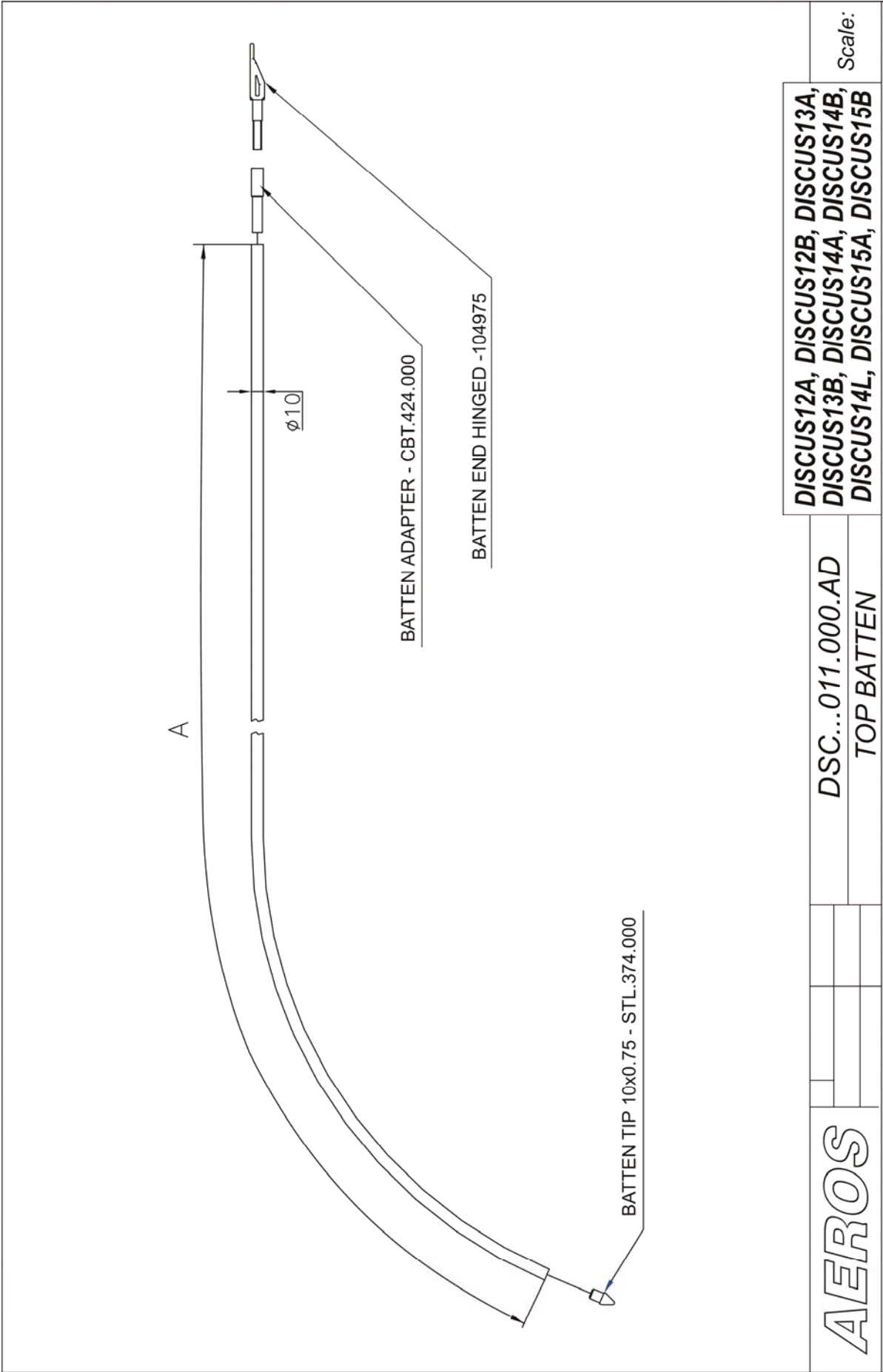


**AEROS**

DSC...010.000.AD  
BATTENS

DISCUS13A, DISCUS13B,  
DISCUS14A, DISCUS14B, DISCUS14L,  
DISCUS15A, DISCUS15B

Scale:

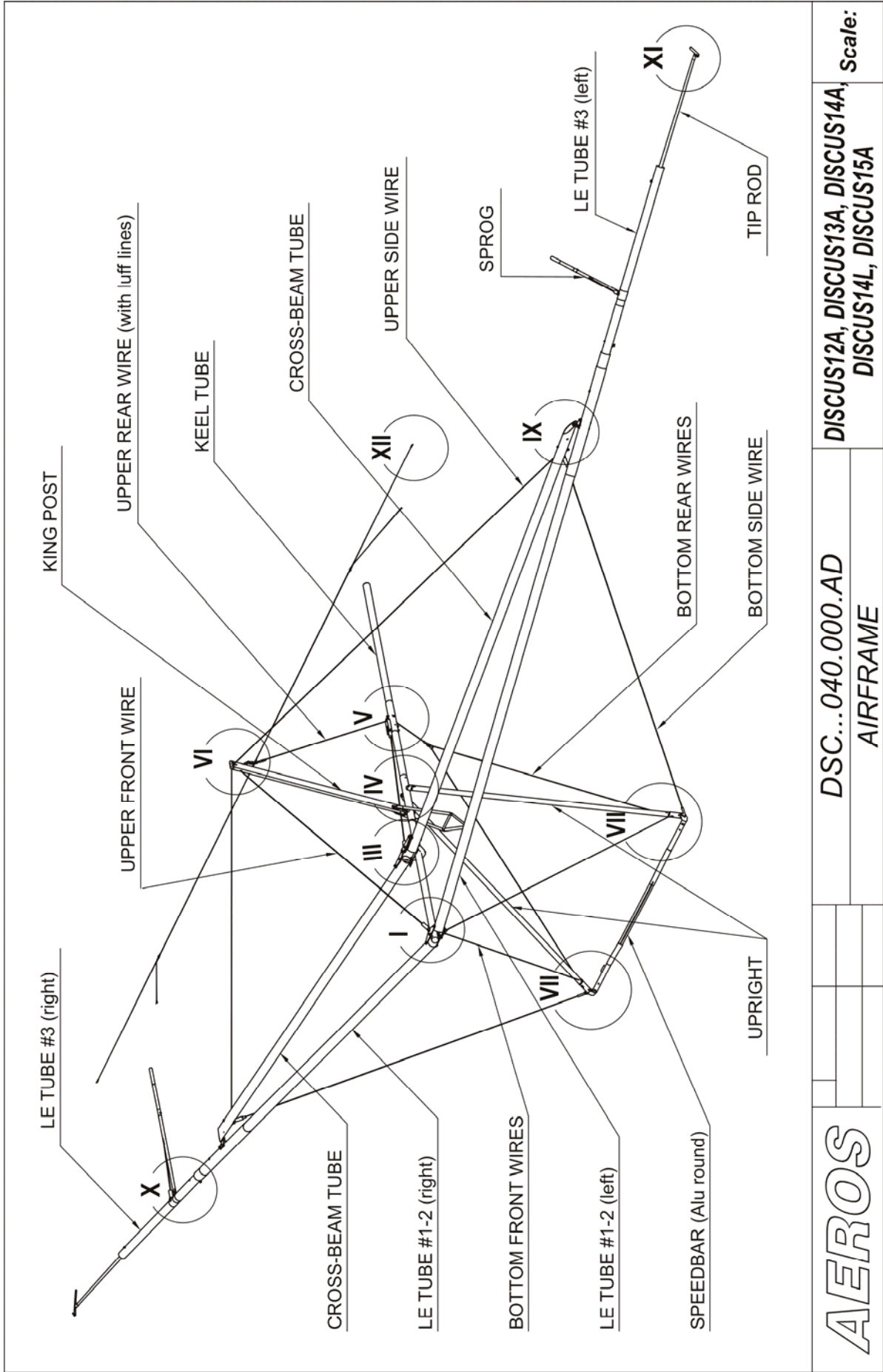


DISCUS12A, DISCUS12B, DISCUS13A,  
DISCUS13B, DISCUS14A, DISCUS14B,  
DISCUS14L, DISCUS15A, DISCUS15B

DSC...011.000.AD  
TOP BATTEN

**AEROS**

Scale:

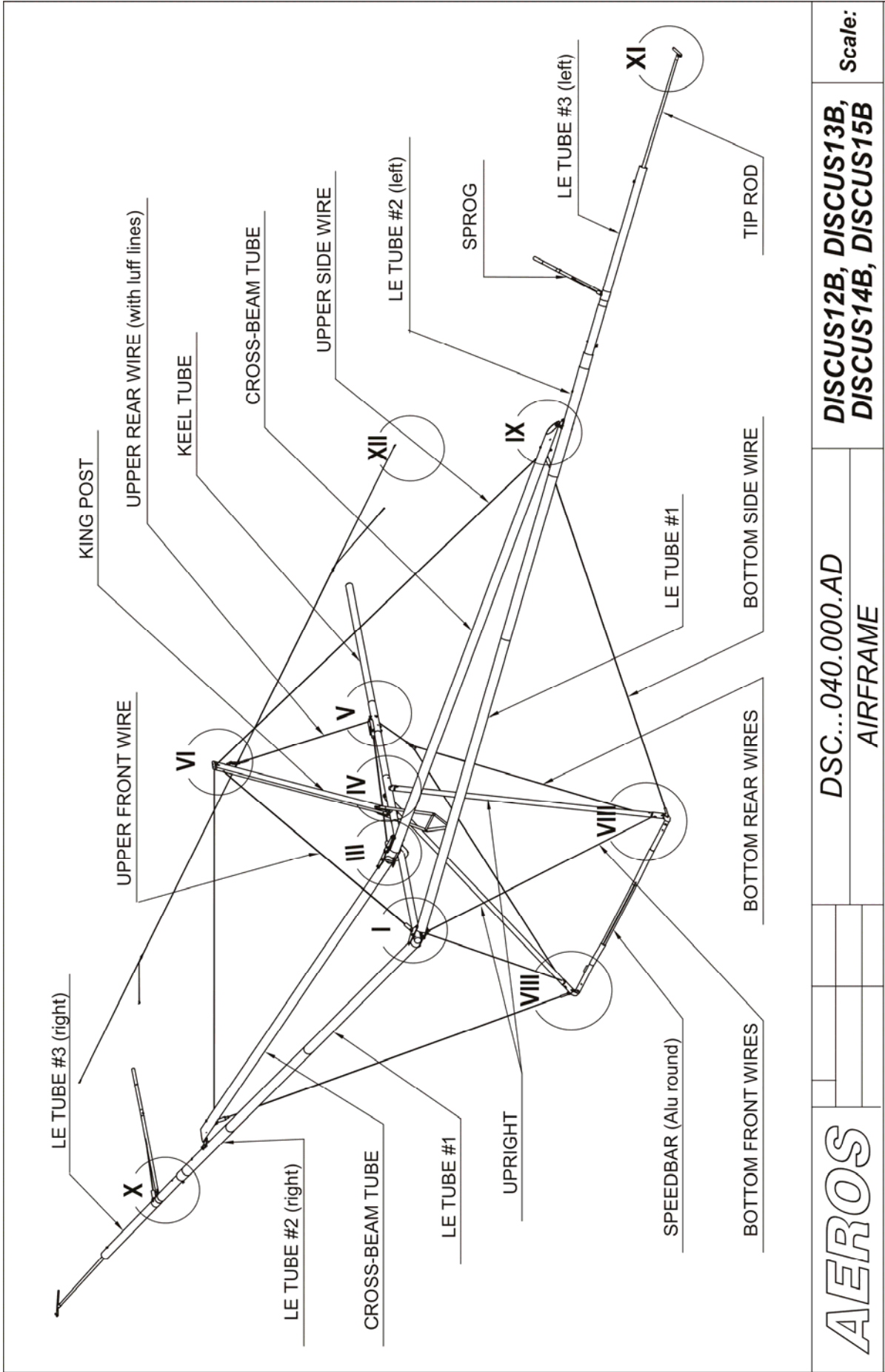


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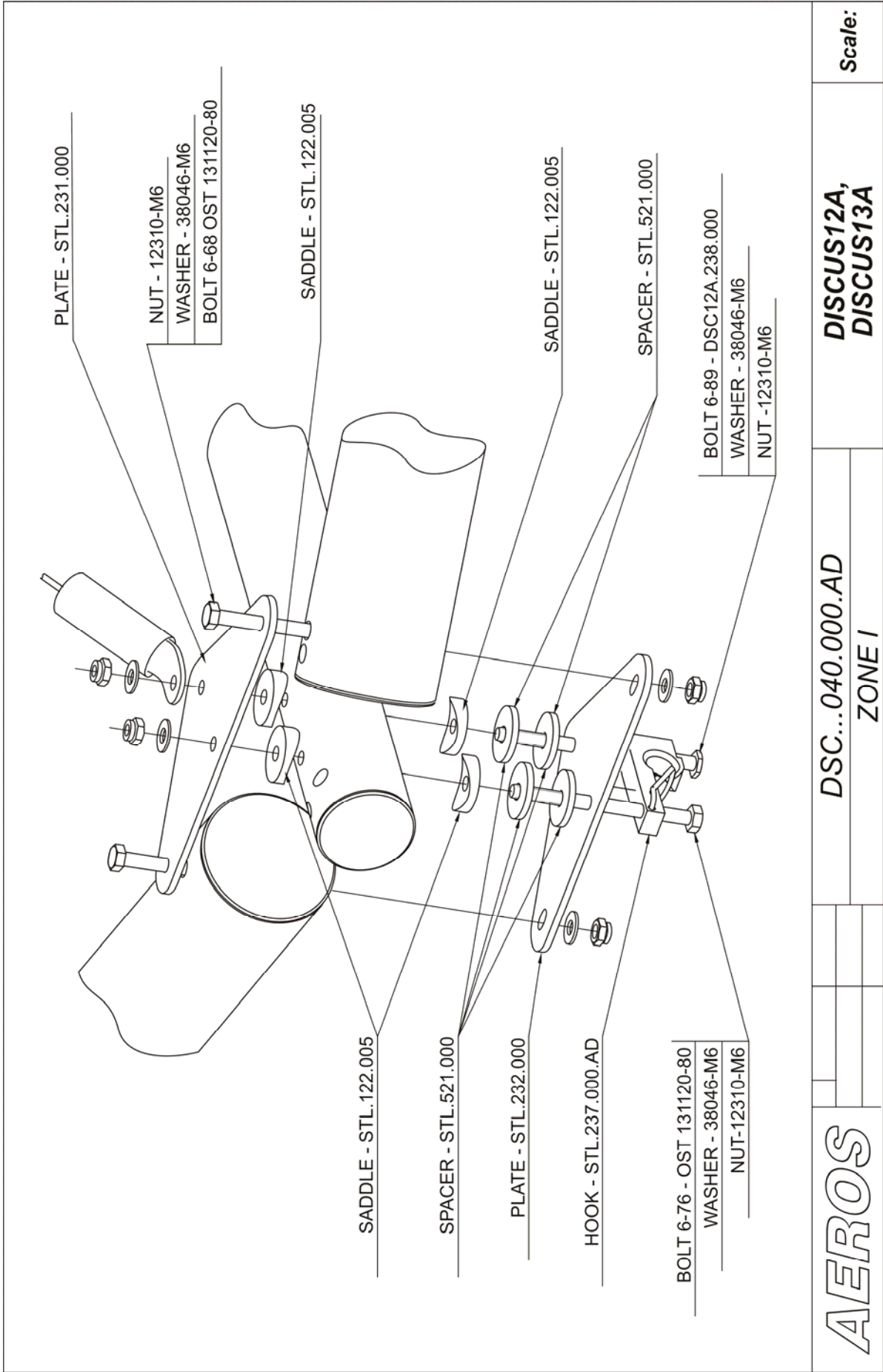
DSC...040.000.AD  
AIRFRAME

DISCUS12A, DISCUS13A, DISCUS14A,  
DISCUS14L, DISCUS15A

Scale:



<b>AEROS</b>	DSC...040.000.AD	DISCUS12B, DISCUS13B, DISCUS14B, DISCUS15B	Scale:
	AIRFRAME		

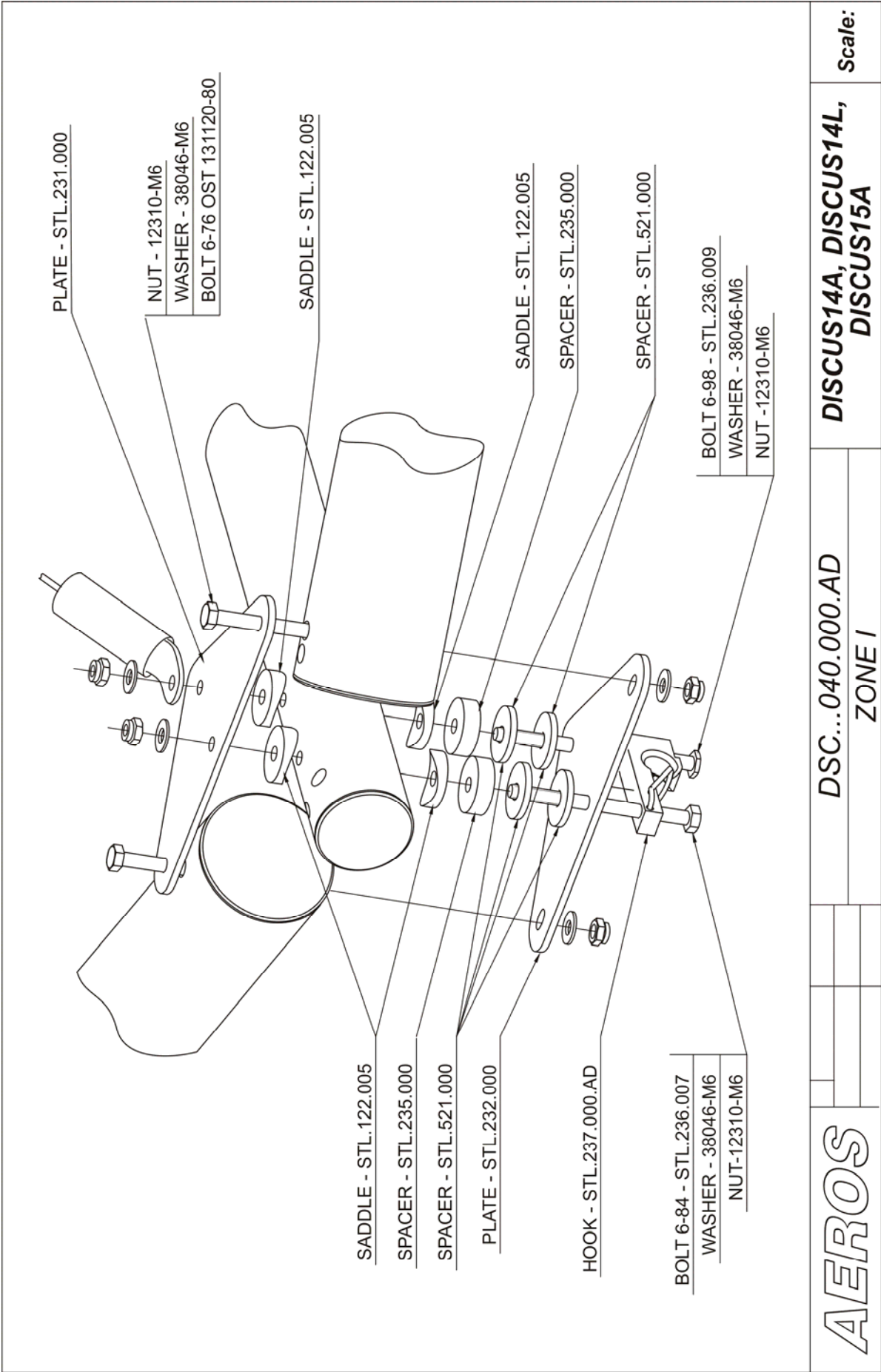


DSC...040.000.AD  
ZONE I

DISCUS12A,  
DISCUS13A

Scale:

**AEROS**

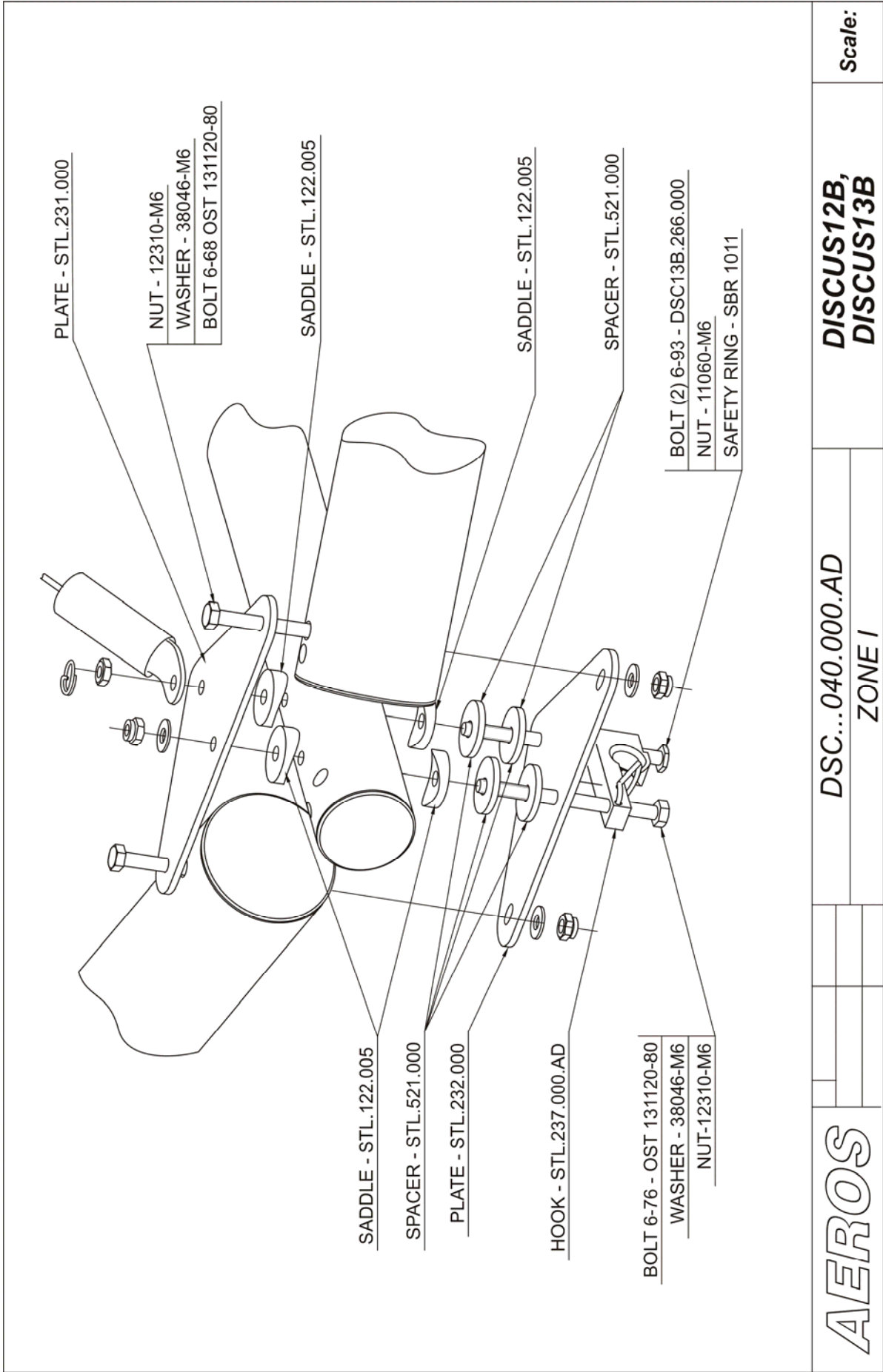


Scale:

**DISCUS14A, DISCUS14L,  
DISCUS15A**

DSC...040.000.AD  
ZONE I

**AEROS**

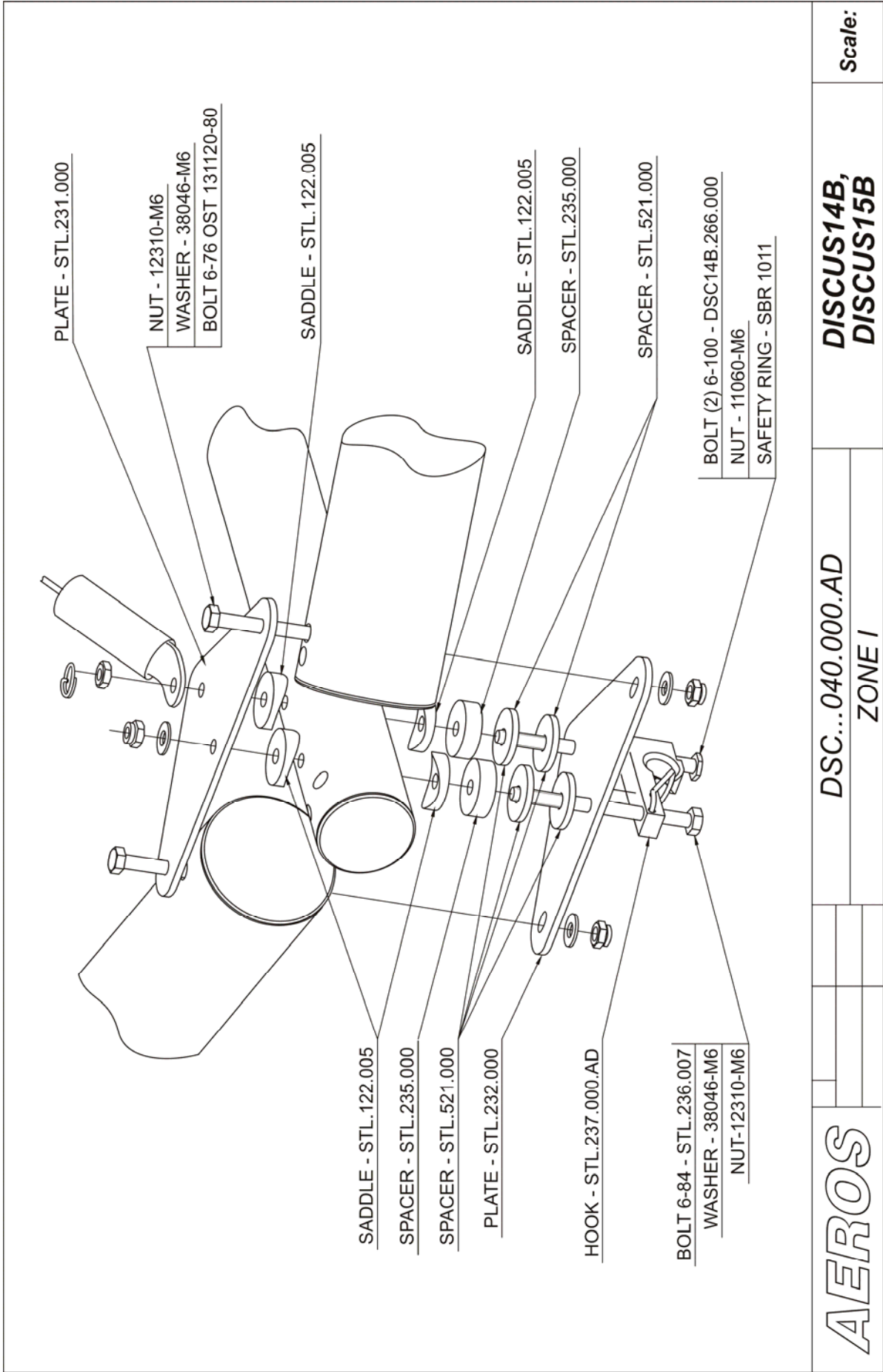


Scale:

**DISCUS12B,  
DISCUS13B**

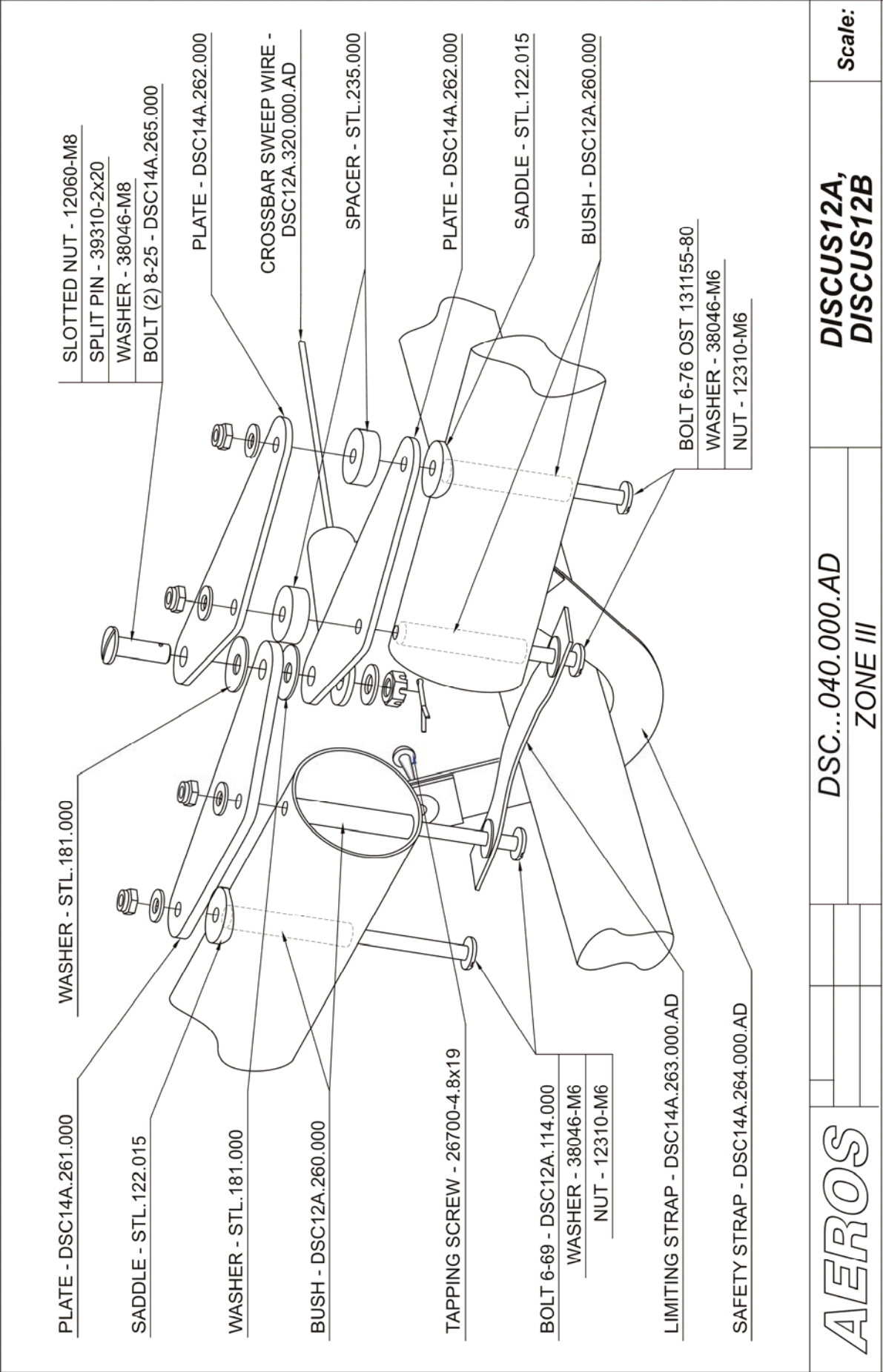
DSC...040.000.AD  
ZONE I

**AEROS**



<b>AEROS</b>	DSC...040.000.AD	<b>DISCUS14B, DISCUS15B</b>	Scale:
	ZONE I		



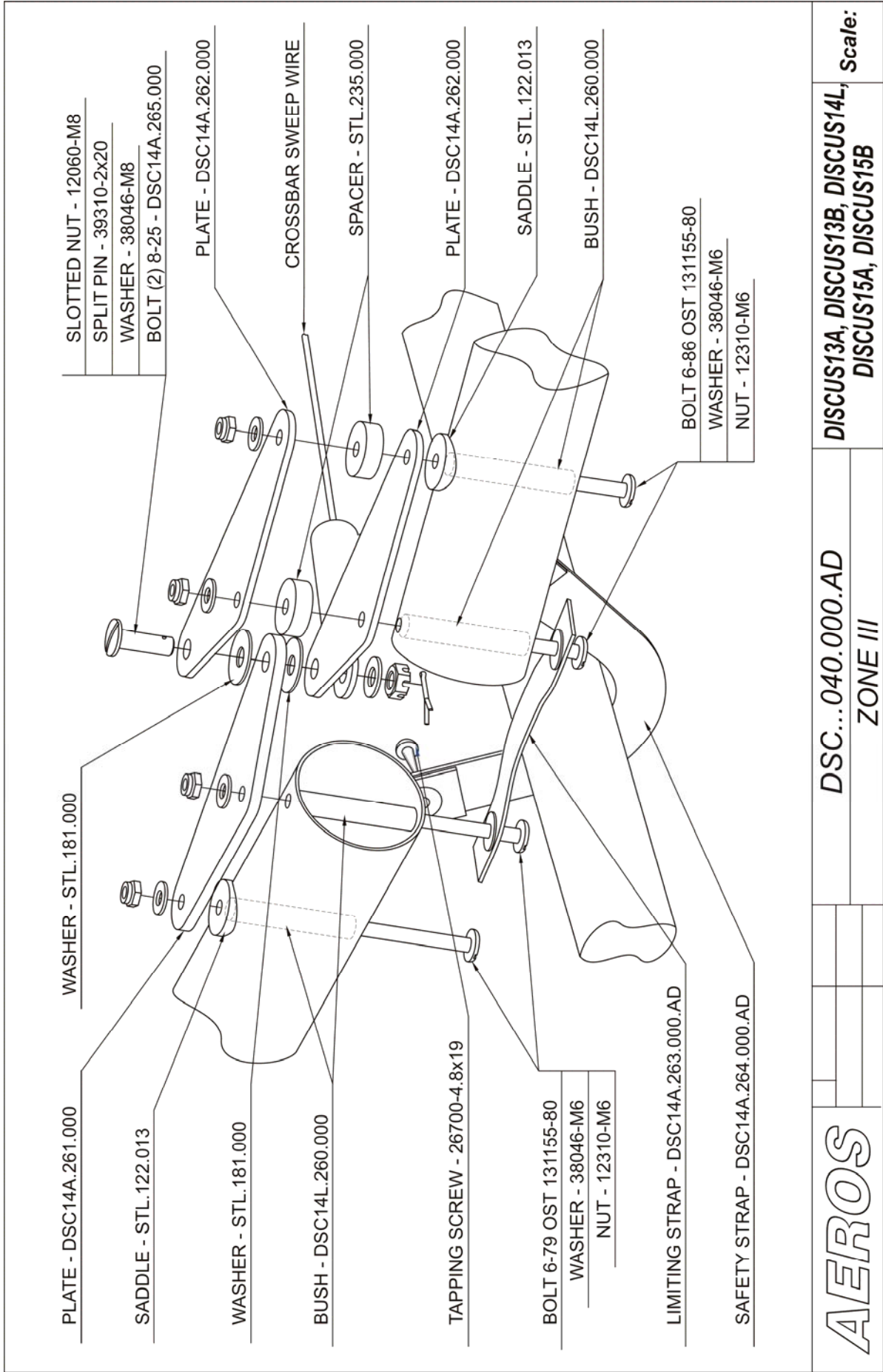


**AEROS**

DSC...040.000.AD  
 ZONE III

**DISCUS12A,  
 DISCUS12B**

Scale:



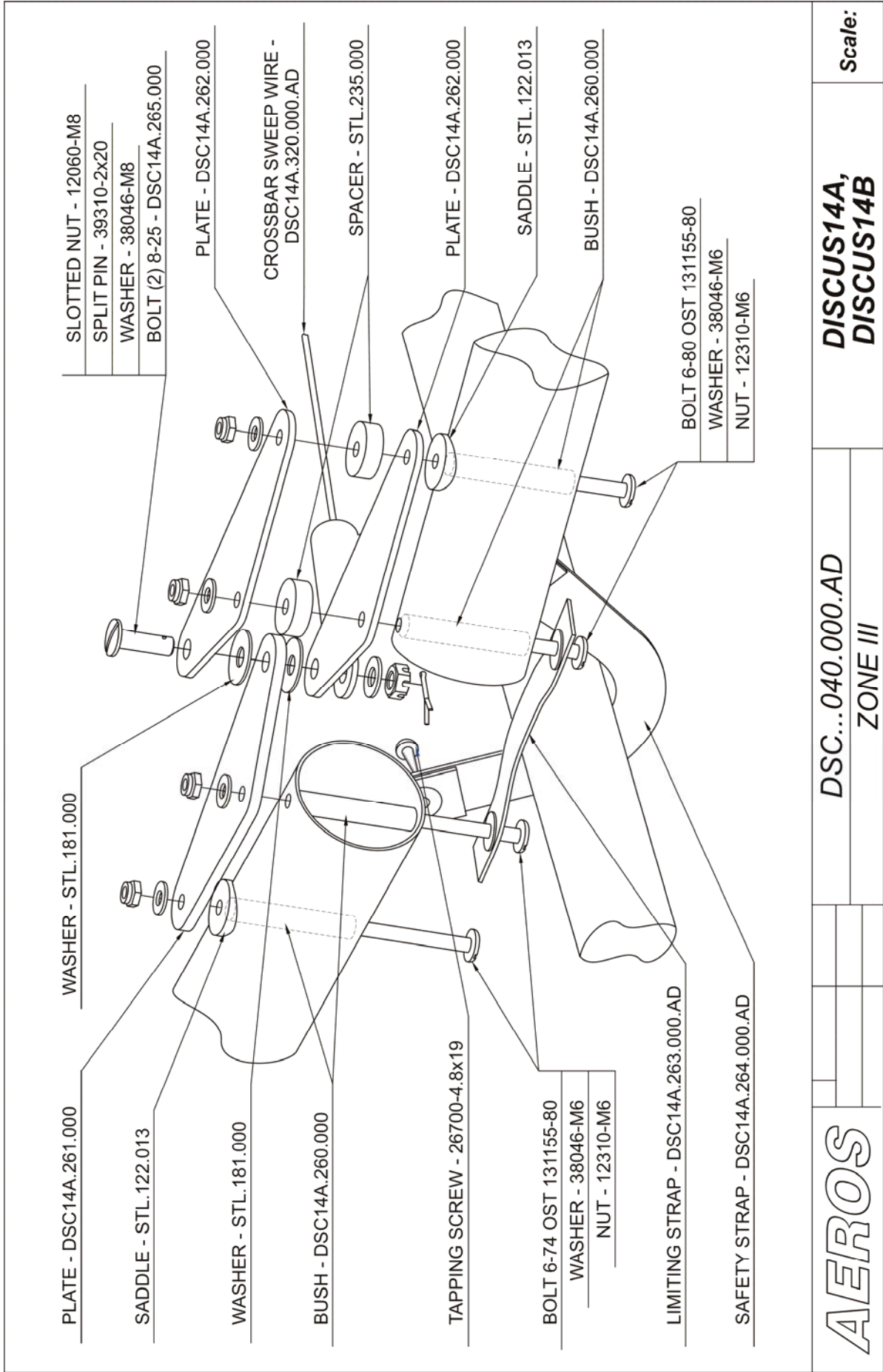
**AEROS**

DSC...040.000.AD

ZONE III

DISCUS13A, DISCUS13B, DISCUS14L,  
DISCUS15A, DISCUS15B

Scale:

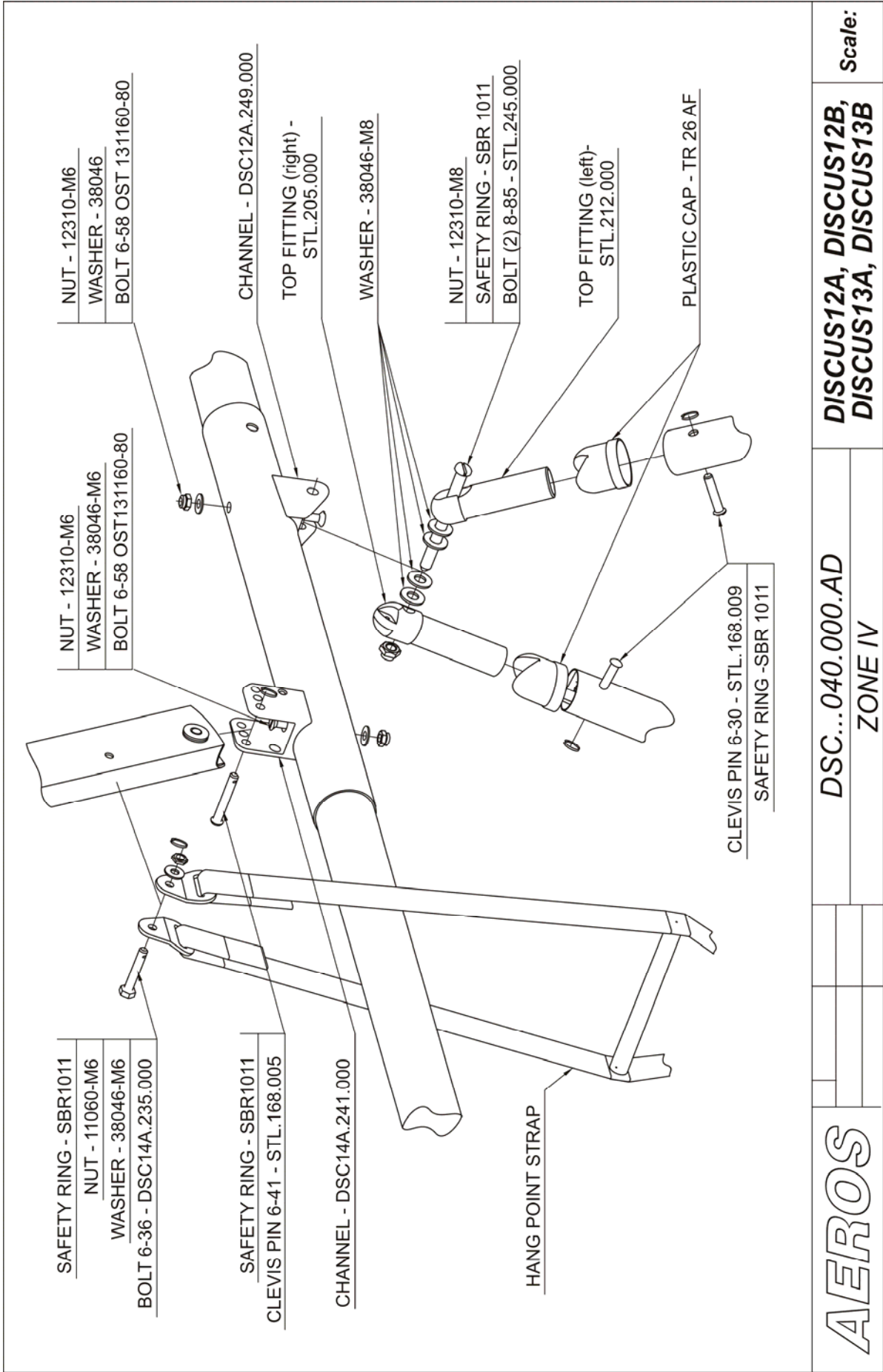


**AEROS**

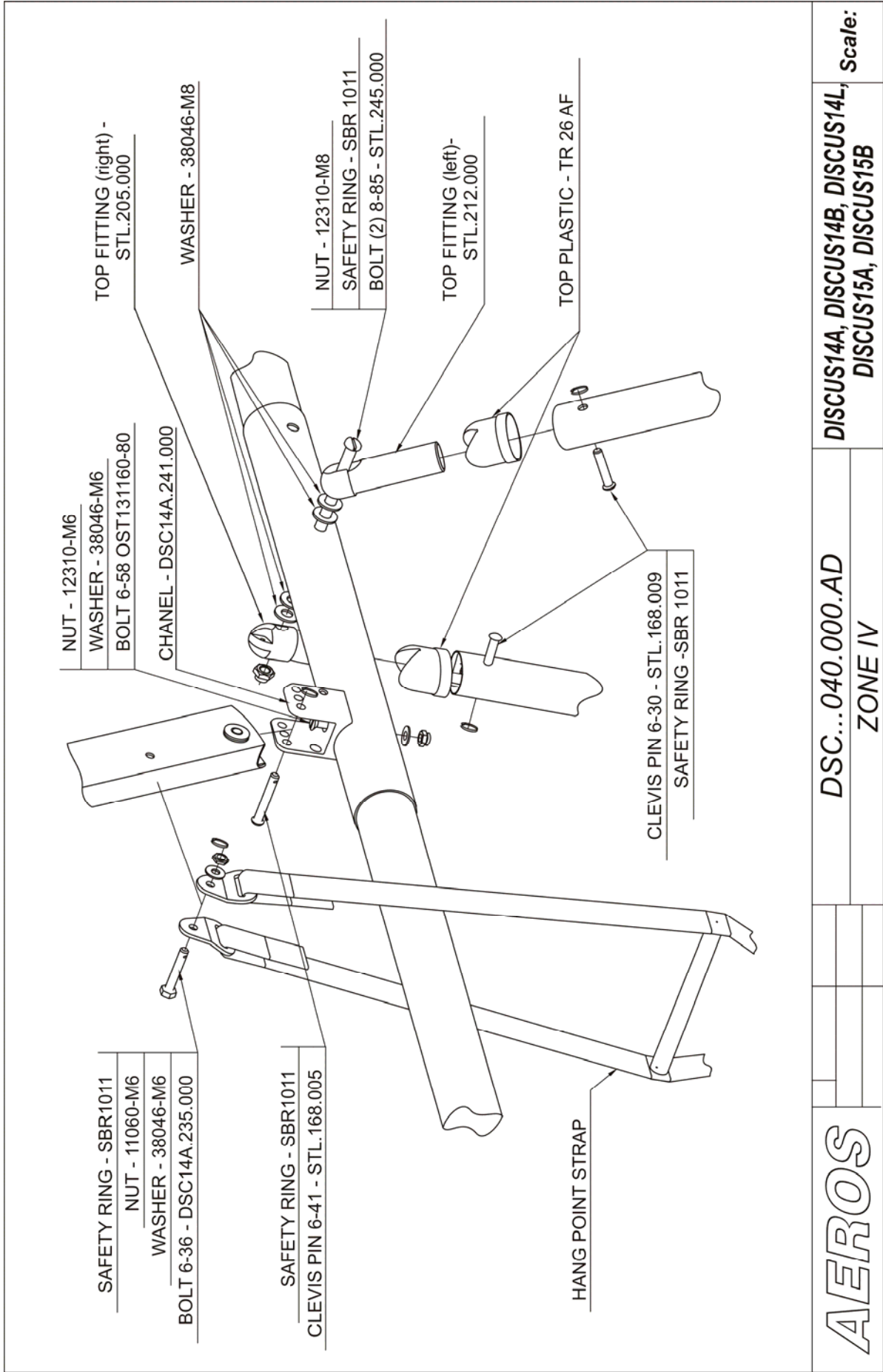
DSC...040.000.AD  
 ZONE III

**DISCUS14A,  
 DISCUS14B**

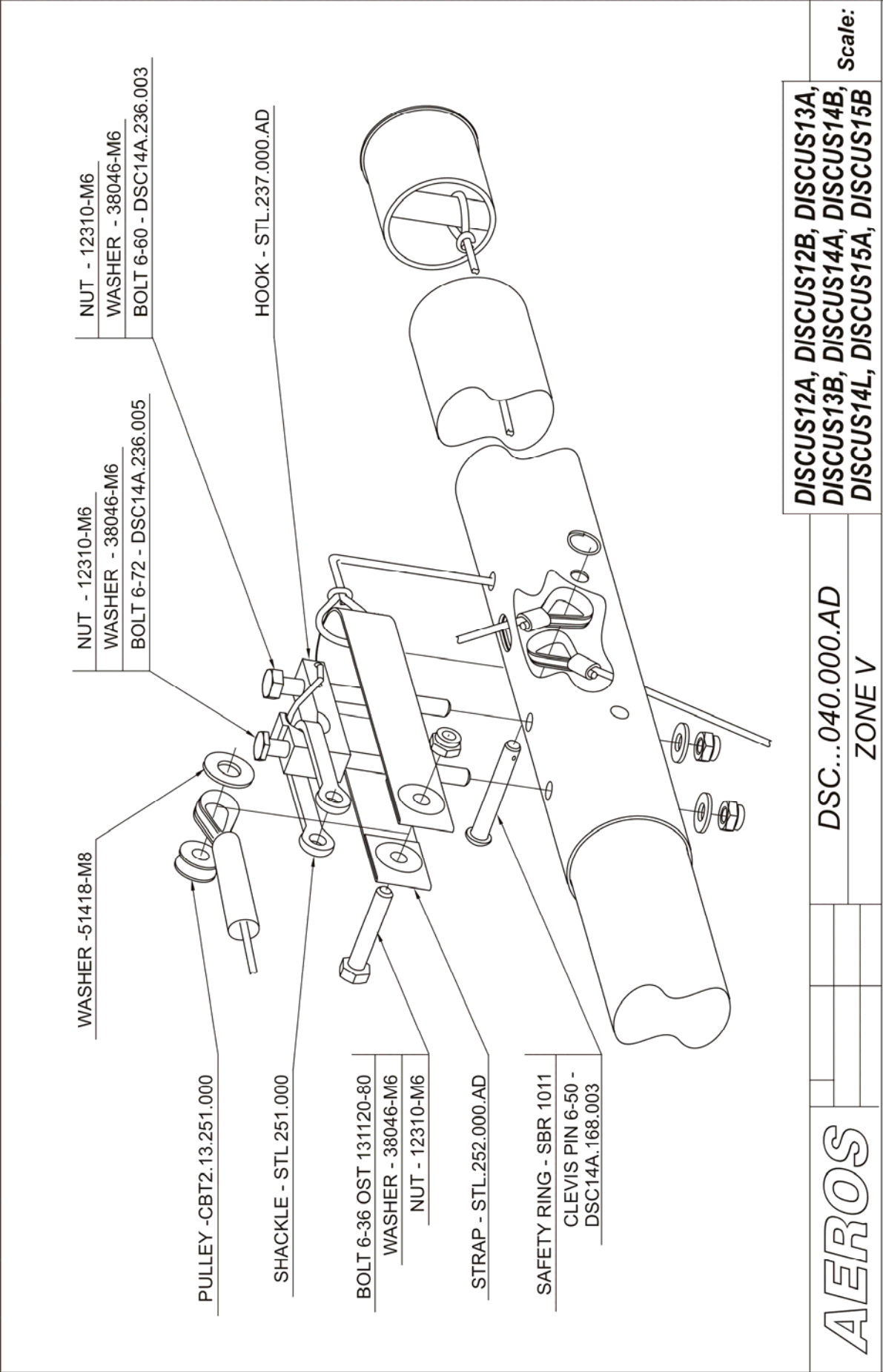
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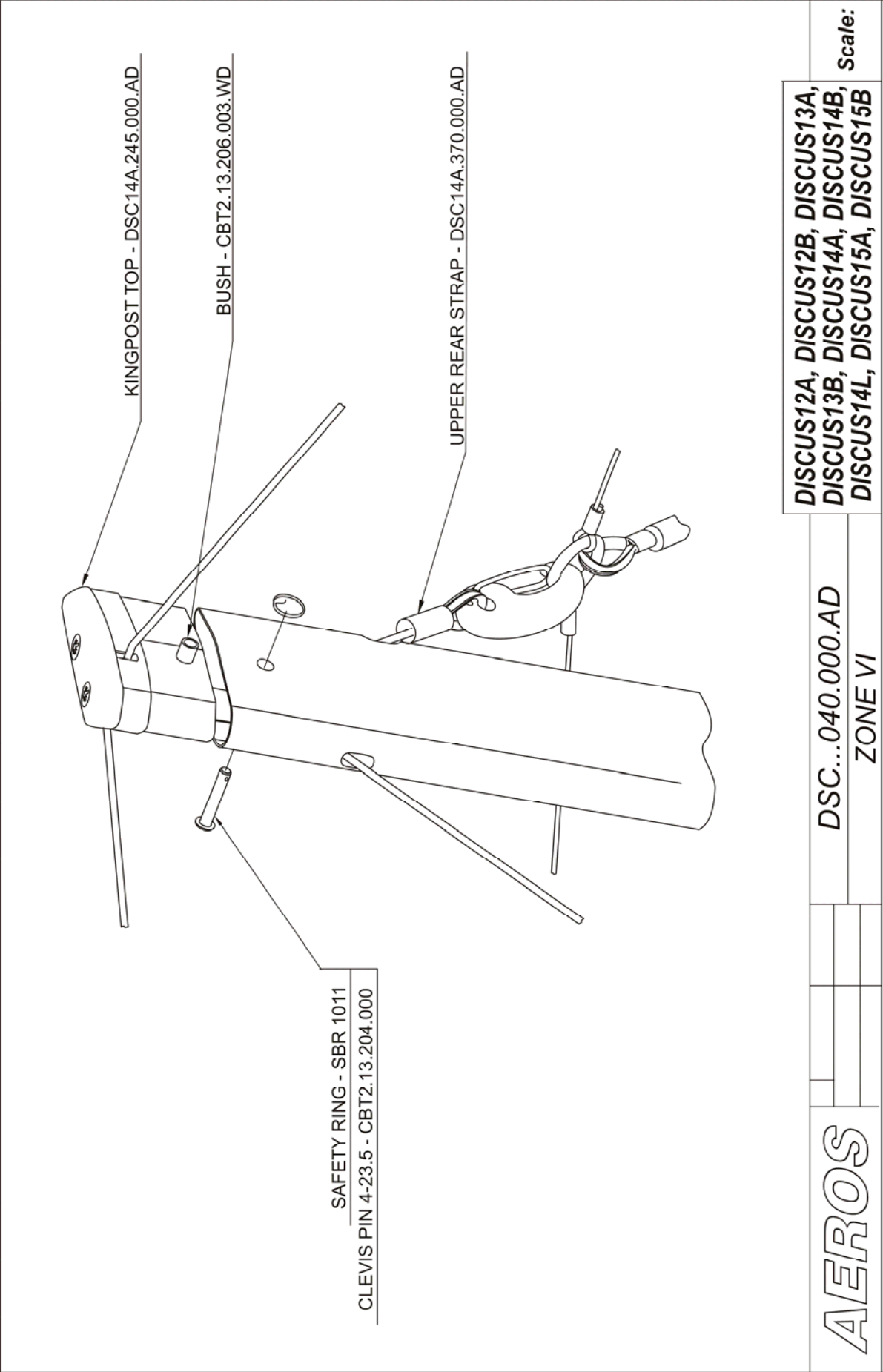


<b>AEROS</b>	DSC...040.000.AD	DISCUS12A, DISCUS12B, DISCUS13A, DISCUS13B	Scale:
	ZONE IV		



<b>AEROS</b>	DSC...040.000.AD	DISCUS14A, DISCUS14B, DISCUS14L, DISCUS15A, DISCUS15B	Scale:
	ZONE IV		



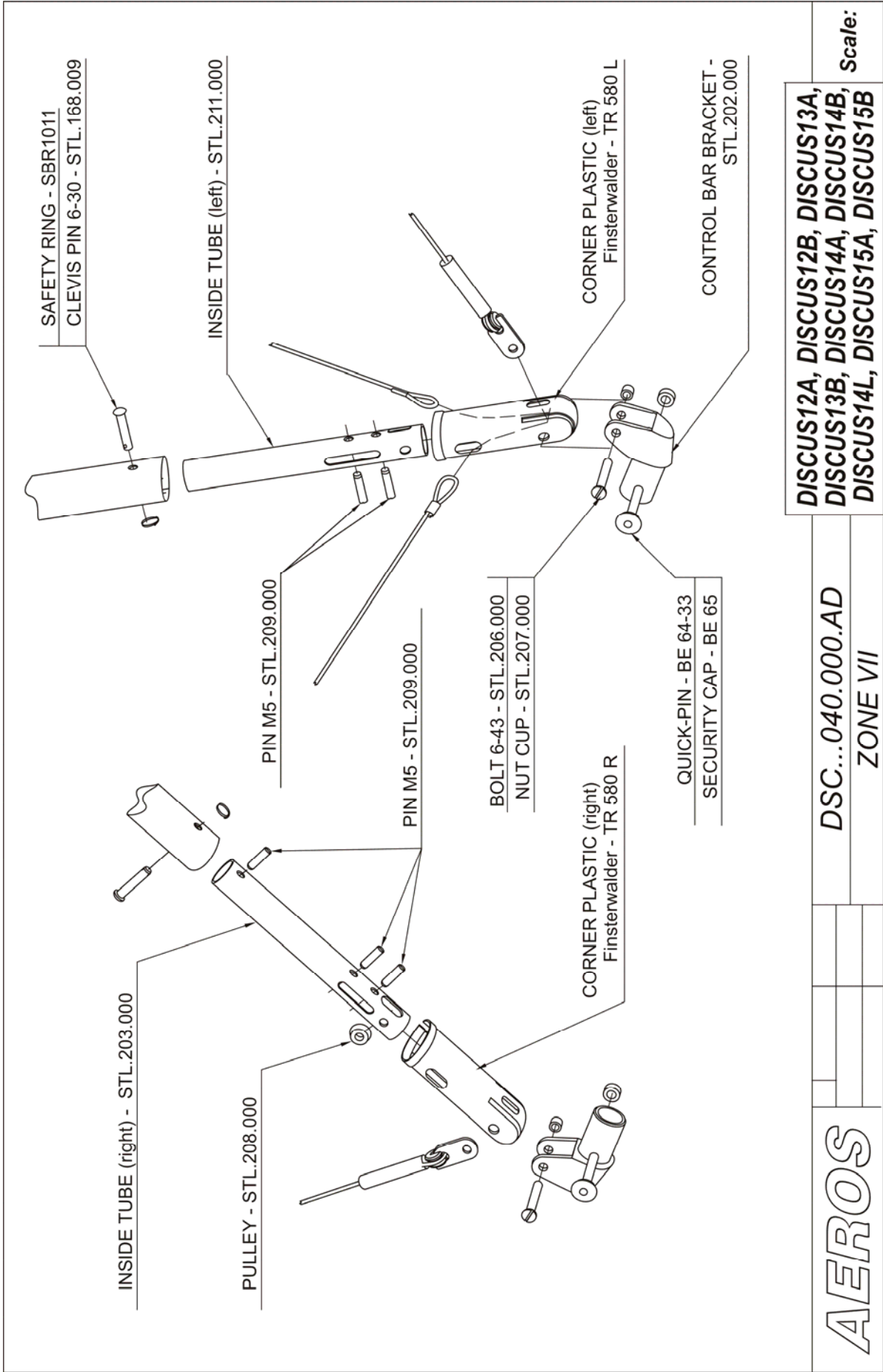


DISCUS12A, DISCUS12B, DISCUS13A,  
 DISCUS13B, DISCUS14A, DISCUS14B,  
 DISCUS14L, DISCUS15A, DISCUS15B

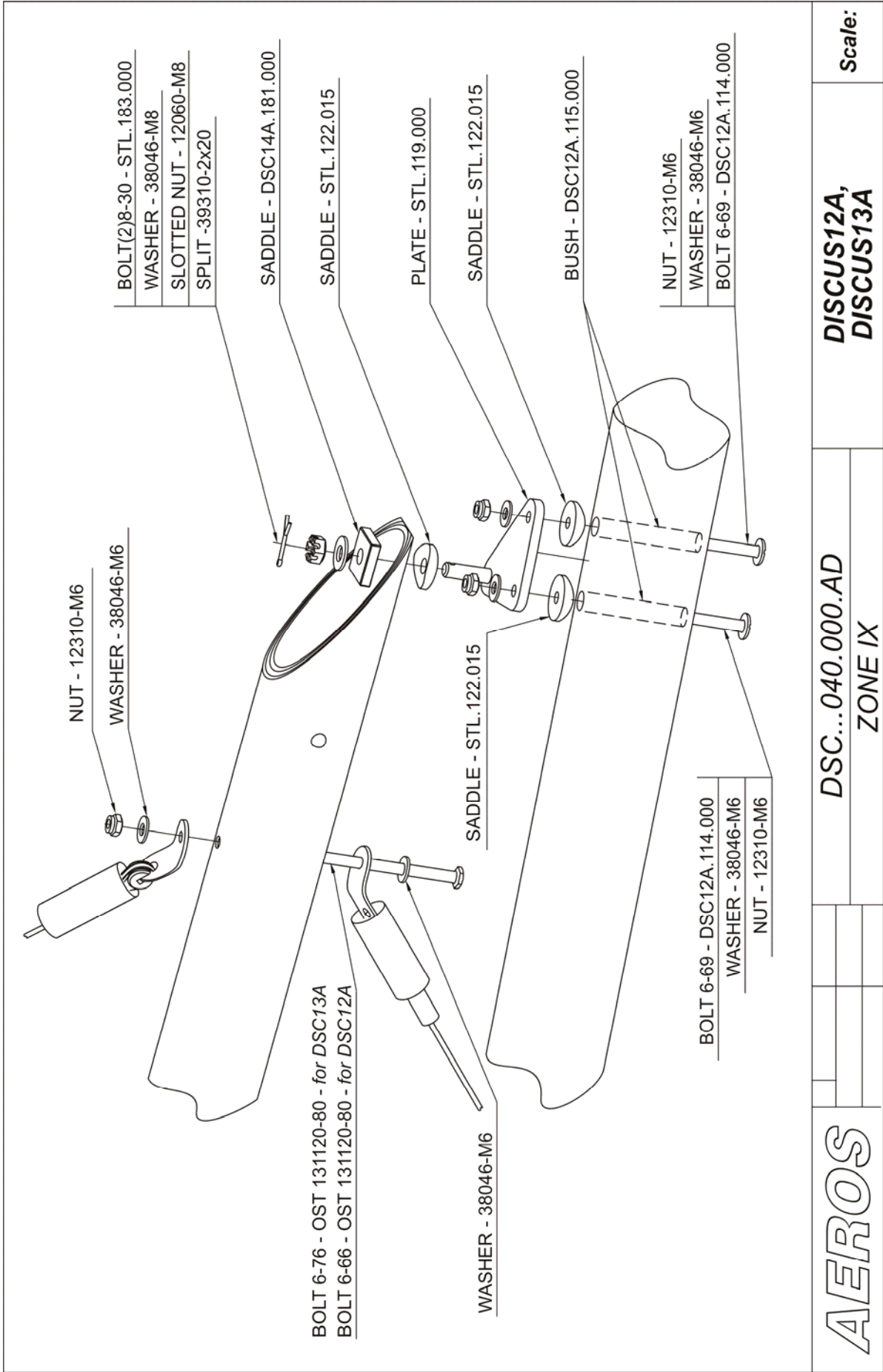
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 ZONE VI

Scale:

**AEROS**





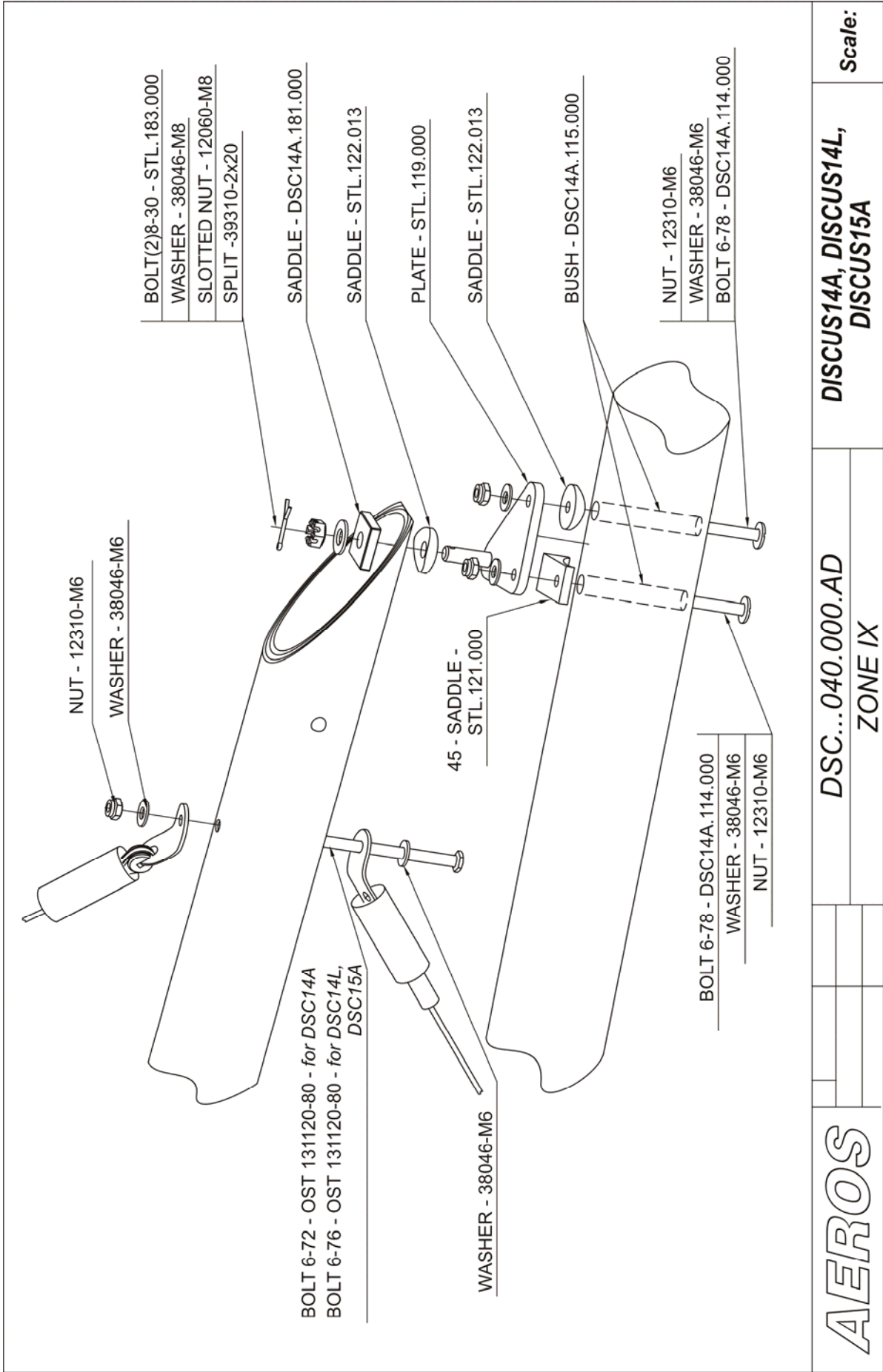


**AEROS**

DSC...040.000.AD  
 ZONE IX

**DISCUS12A,  
 DISCUS13A**

Scale:

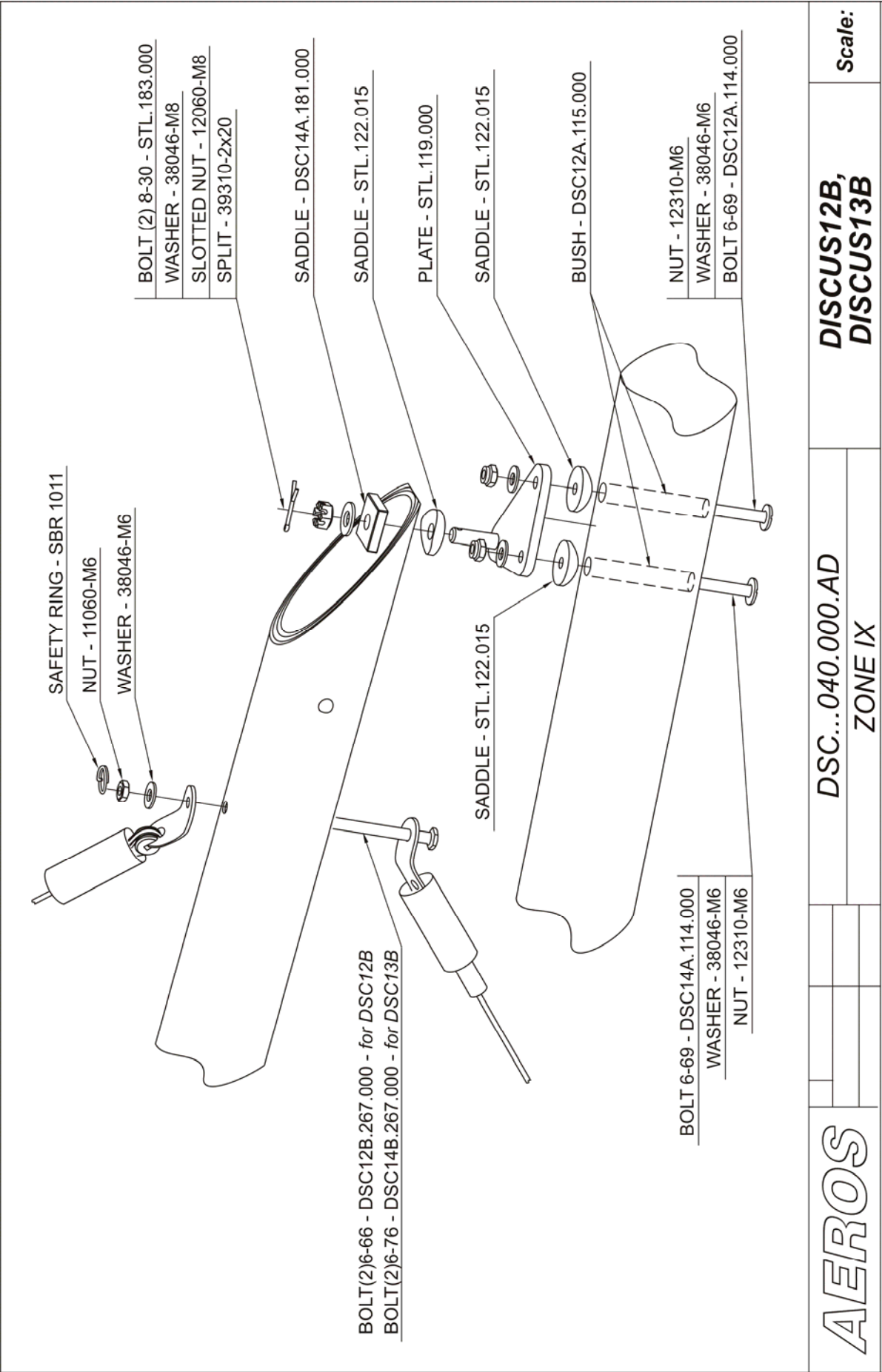


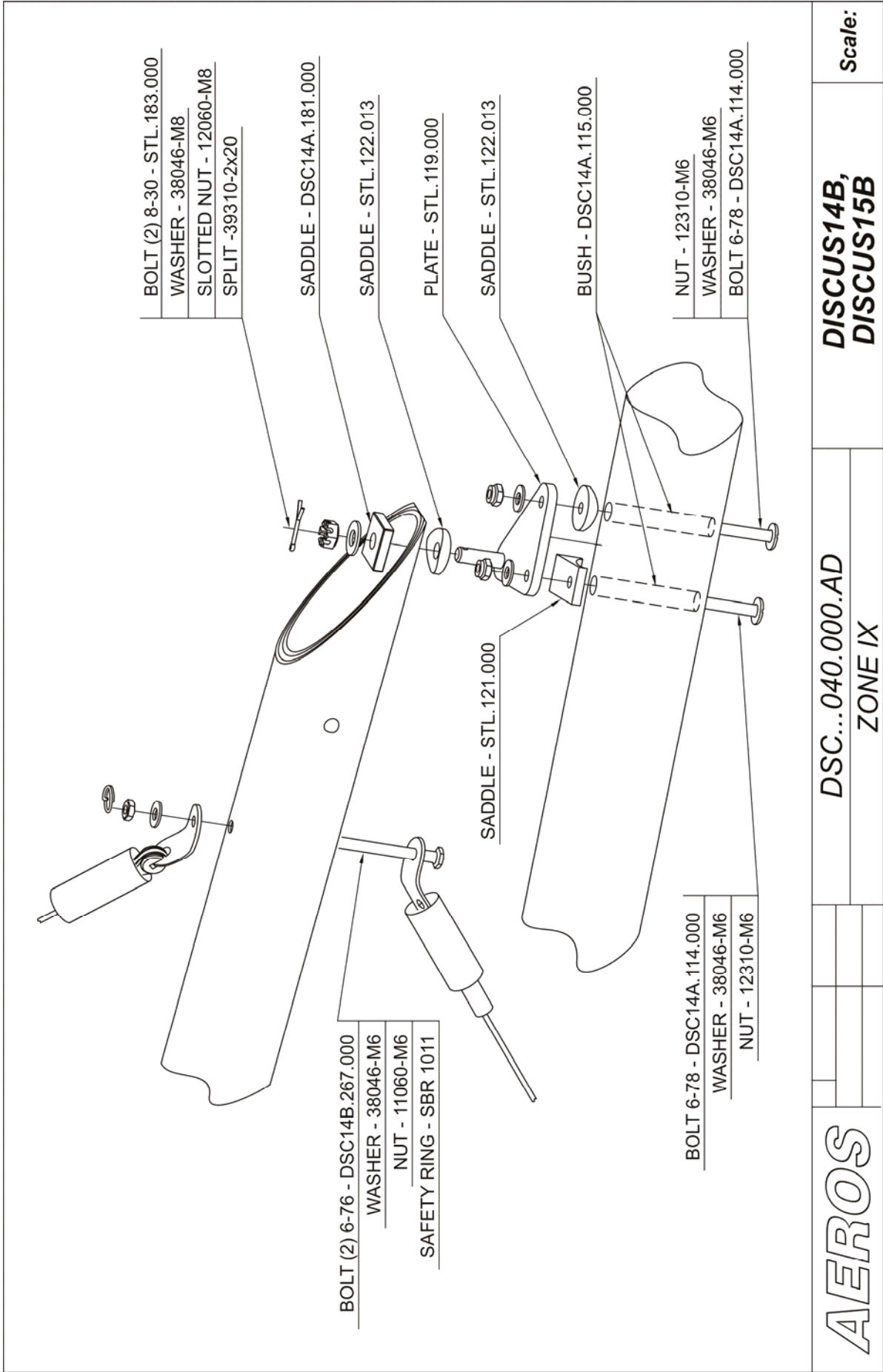
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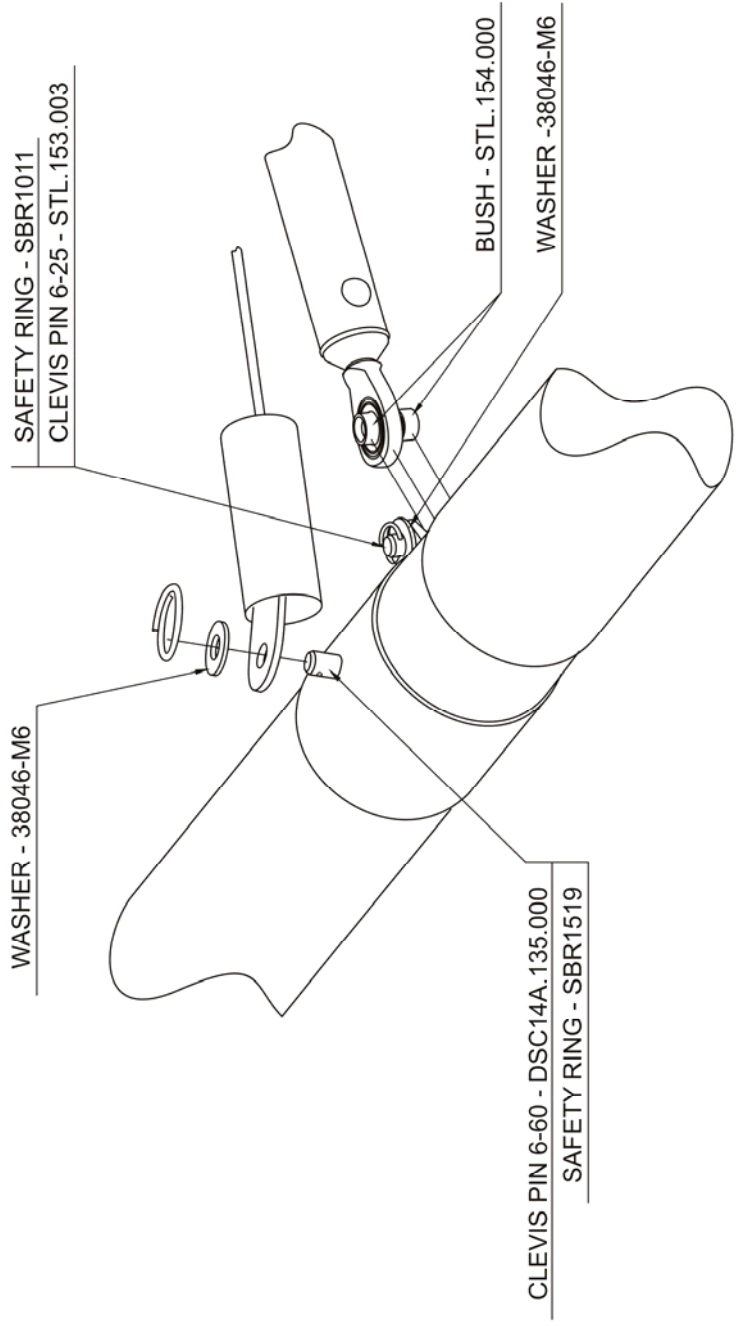
DSC...040.000.AD  
 ZONE IX

DISCUS14A, DISCUS14L,  
 DISCUS15A

Scale:

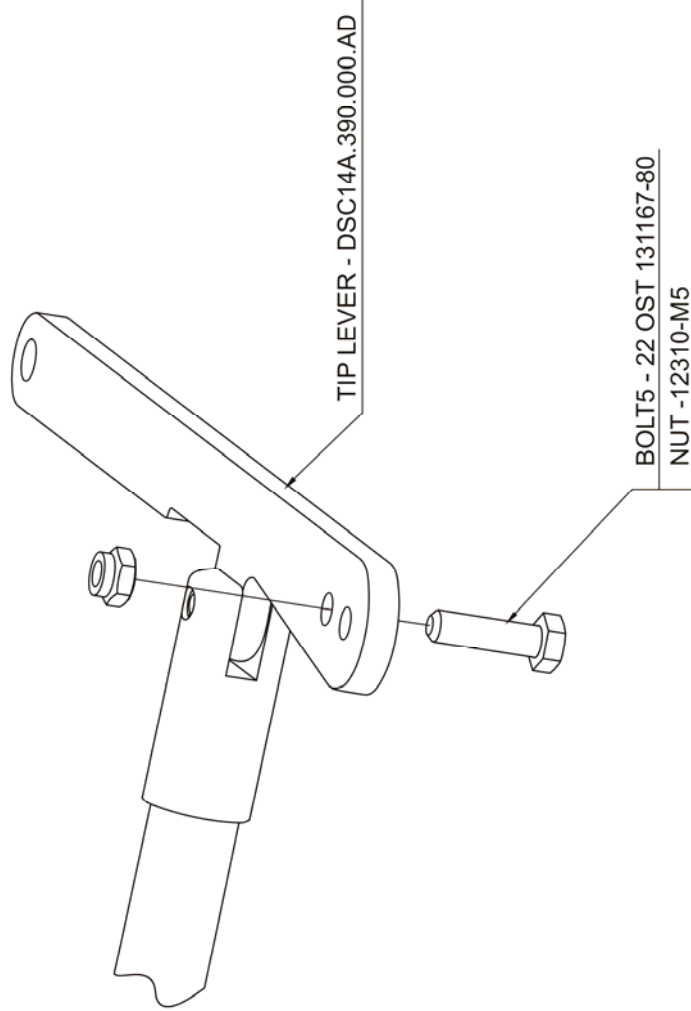




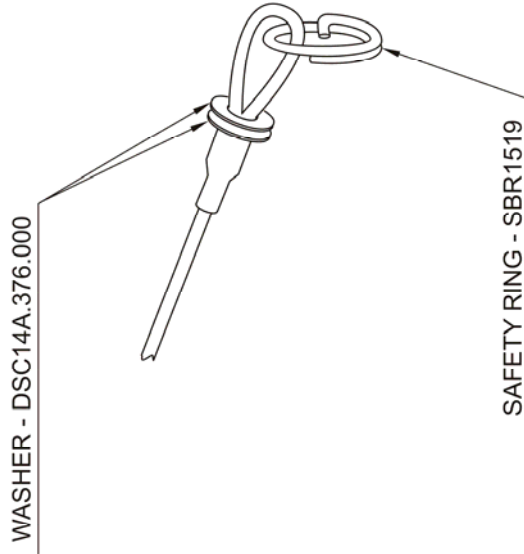


<b>AEROS</b>	DSC...040.000.AD	ZONE X	Scale:
	DISCUS12A, DISCUS12B, DISCUS13A, DISCUS13B, DISCUS14A, DISCUS14B, DISCUS14L, DISCUS15A, DISCUS15B		

**ZONE XI**



**ZONE XII**

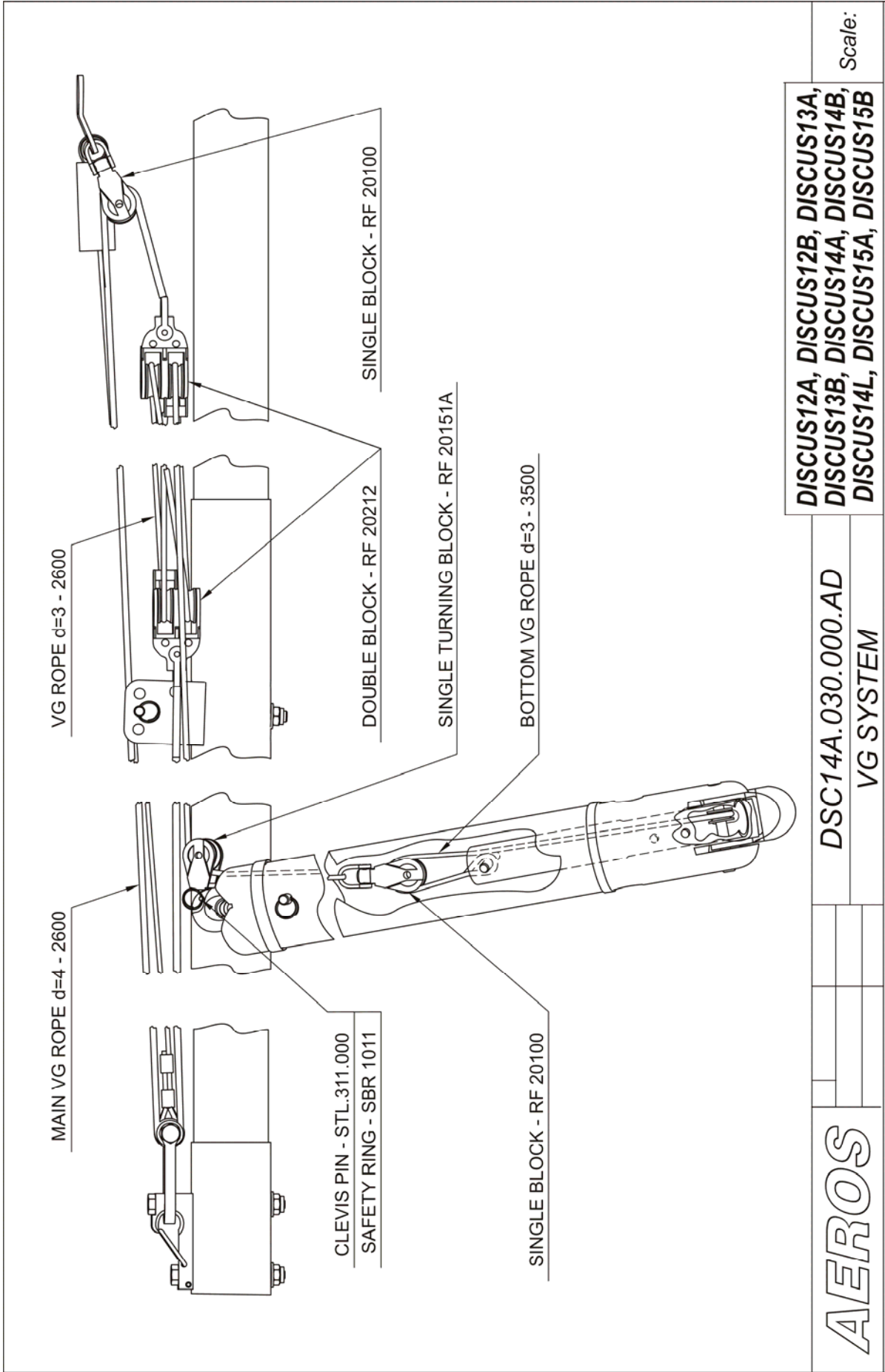


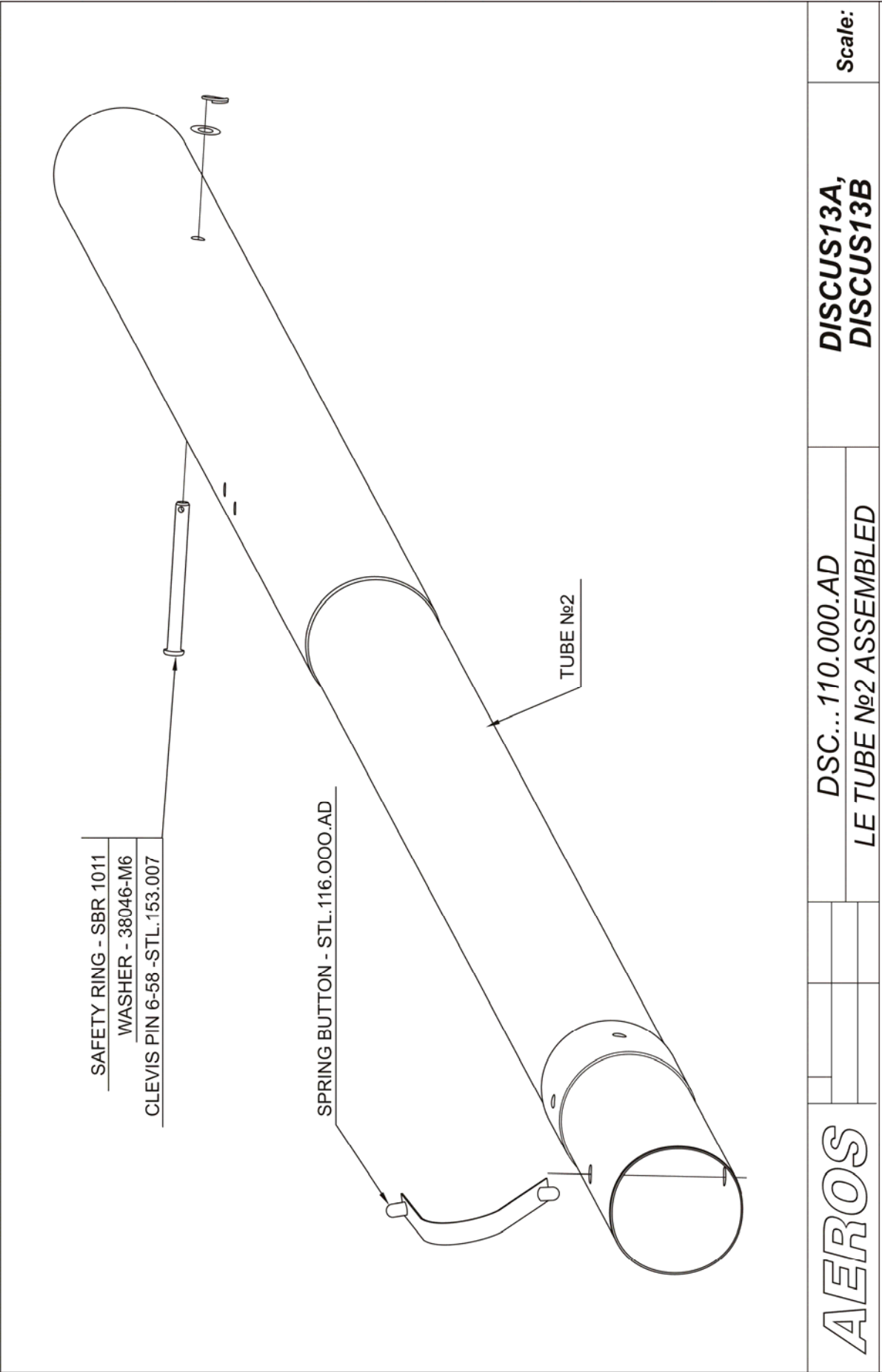
**DISCUS12A, DISCUS12B, DISCUS13A,  
DISCUS13B, DISCUS14A, DISCUS14B,  
DISCUS14L, DISCUS15A, DISCUS15B**

**DSC...040.000.AD**  
**ZONES XI, XII**

**AEROS**

**Scale:**





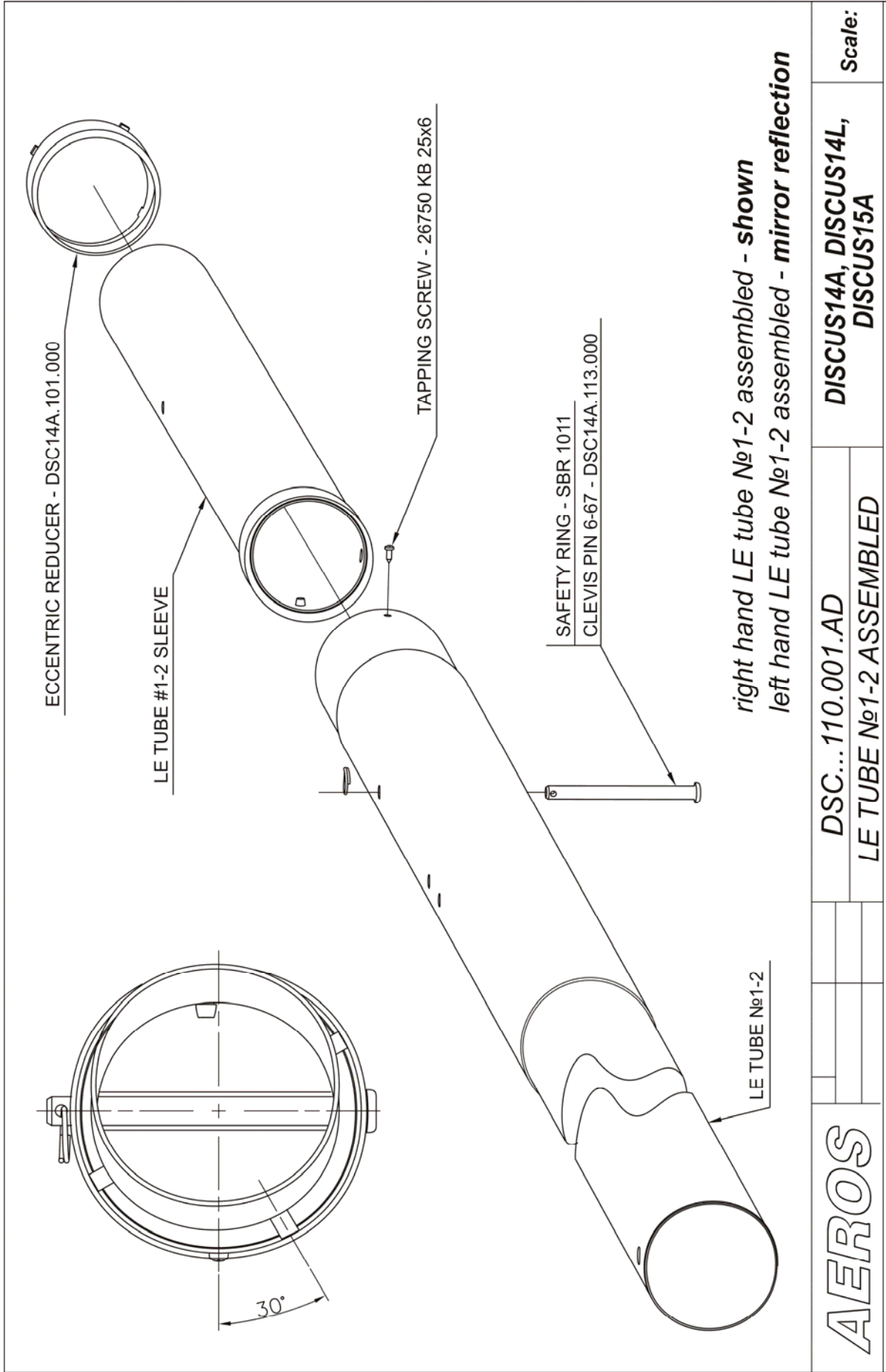
Scale:

**DISCUS13A,  
 DISCUS13B**

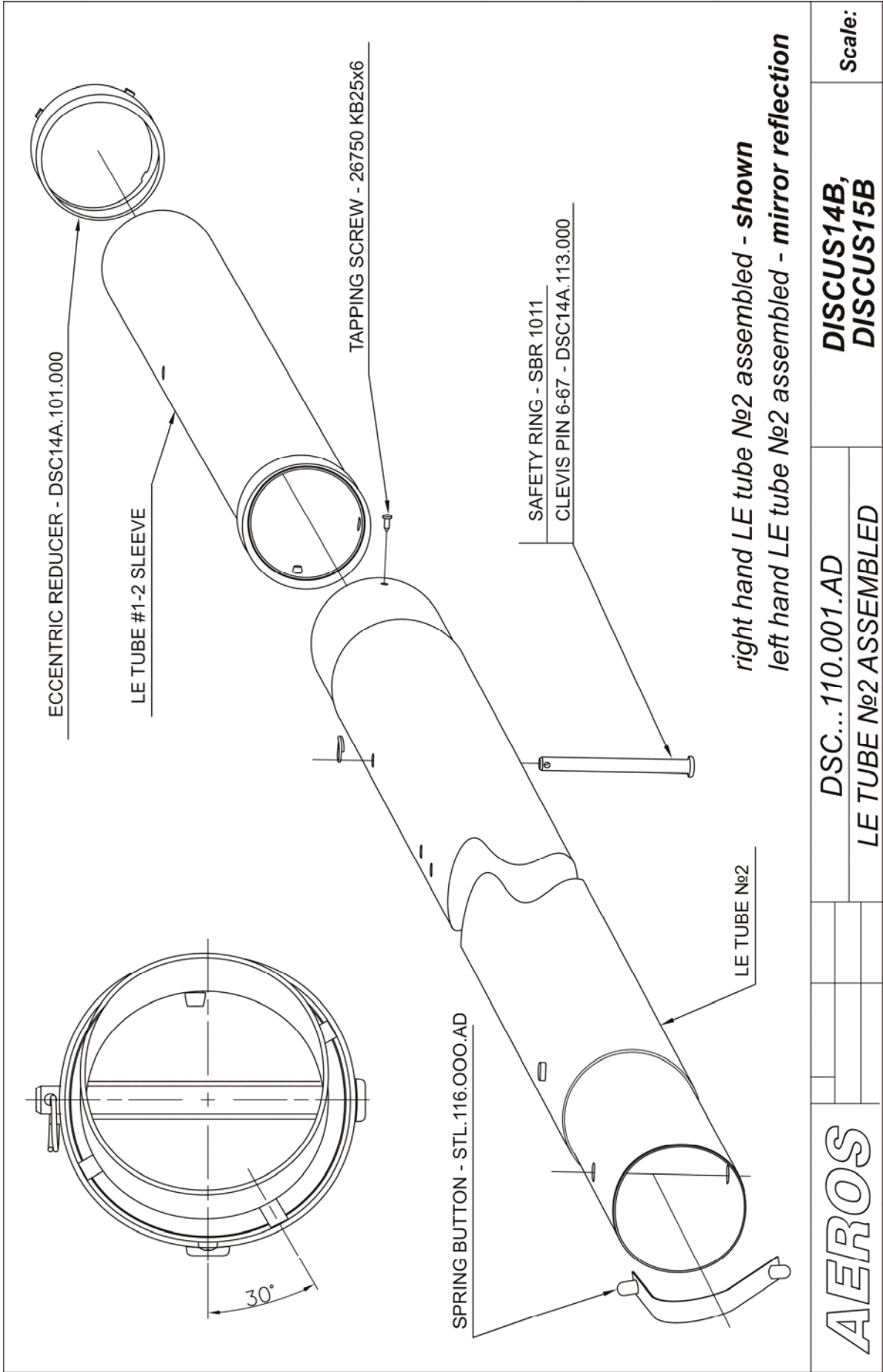
DSC...110.000.AD  
 LE TUBE No2 ASSEMBLED

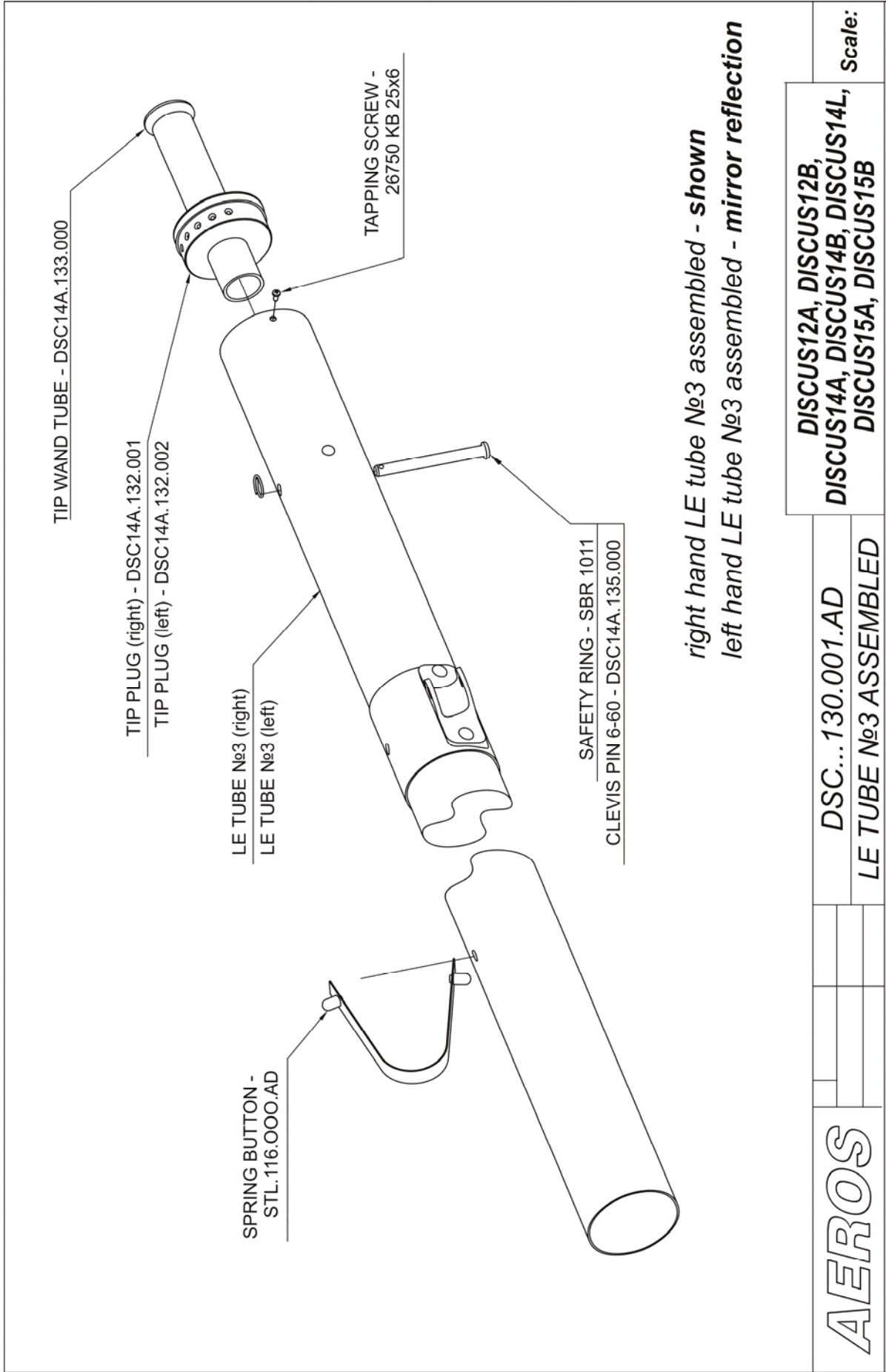

**AEROS**





<b>AEROS</b>	DSC...110.001.AD	DISCUS14A, DISCUS14L, DISCUS15A	Scale:
	LE TUBE №1-2 ASSEMBLED		





TIP WAND TUBE - DSC14A.133.000

TIP PLUG (right) - DSC14A.132.001

TIP PLUG (left) - DSC14A.132.002

LE TUBE №3 (right)

LE TUBE №3 (left)

TAPPING SCREW -  
26750 KB 25x6

SAFETY RING - SBR 1011

CLEVIS PIN 6-60 - DSC14A.135.000

SPRING BUTTON -  
STL.116.000.AD

*right hand LE tube №3 assembled - shown*

*left hand LE tube №3 assembled - mirror reflection*

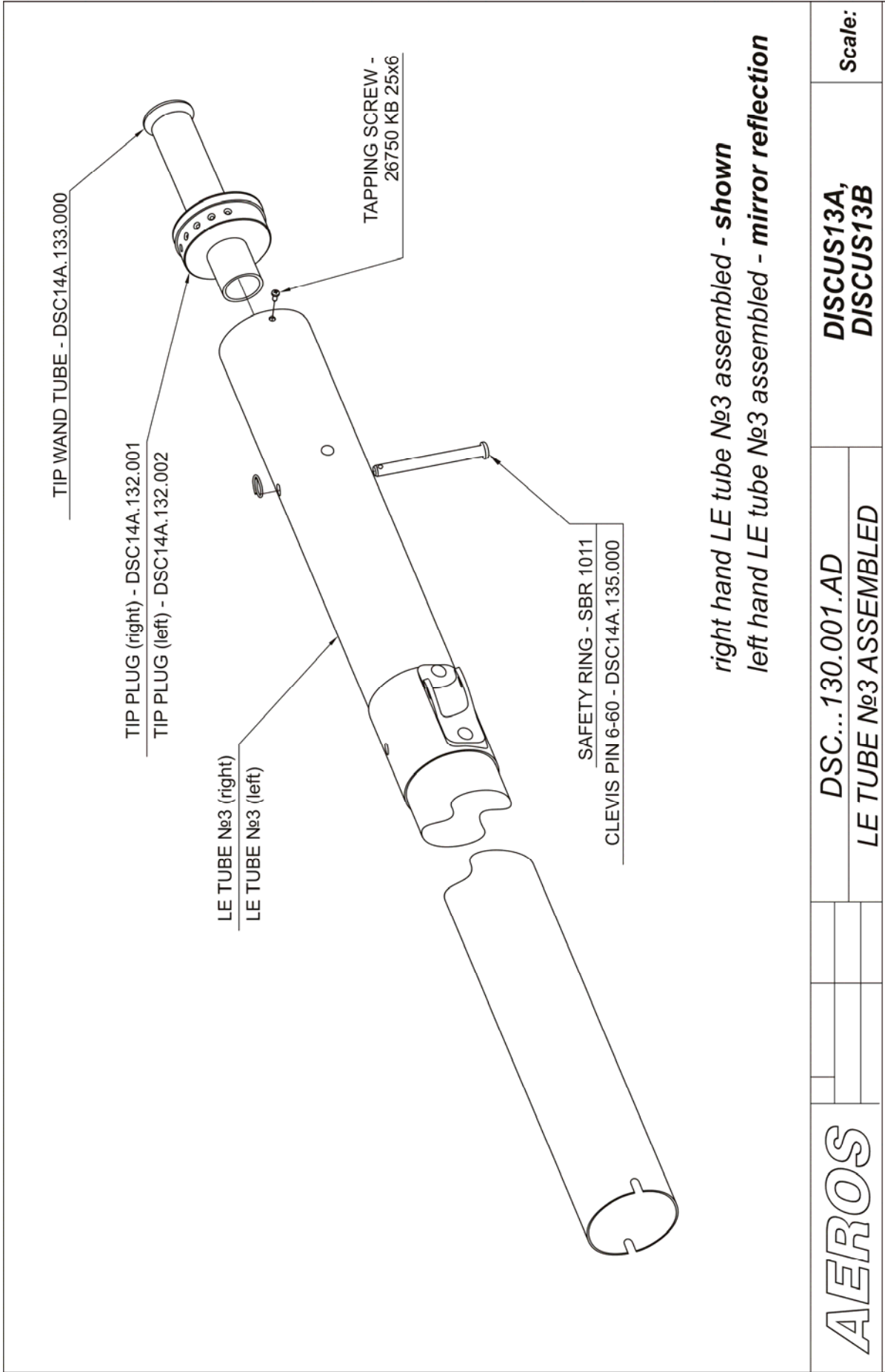
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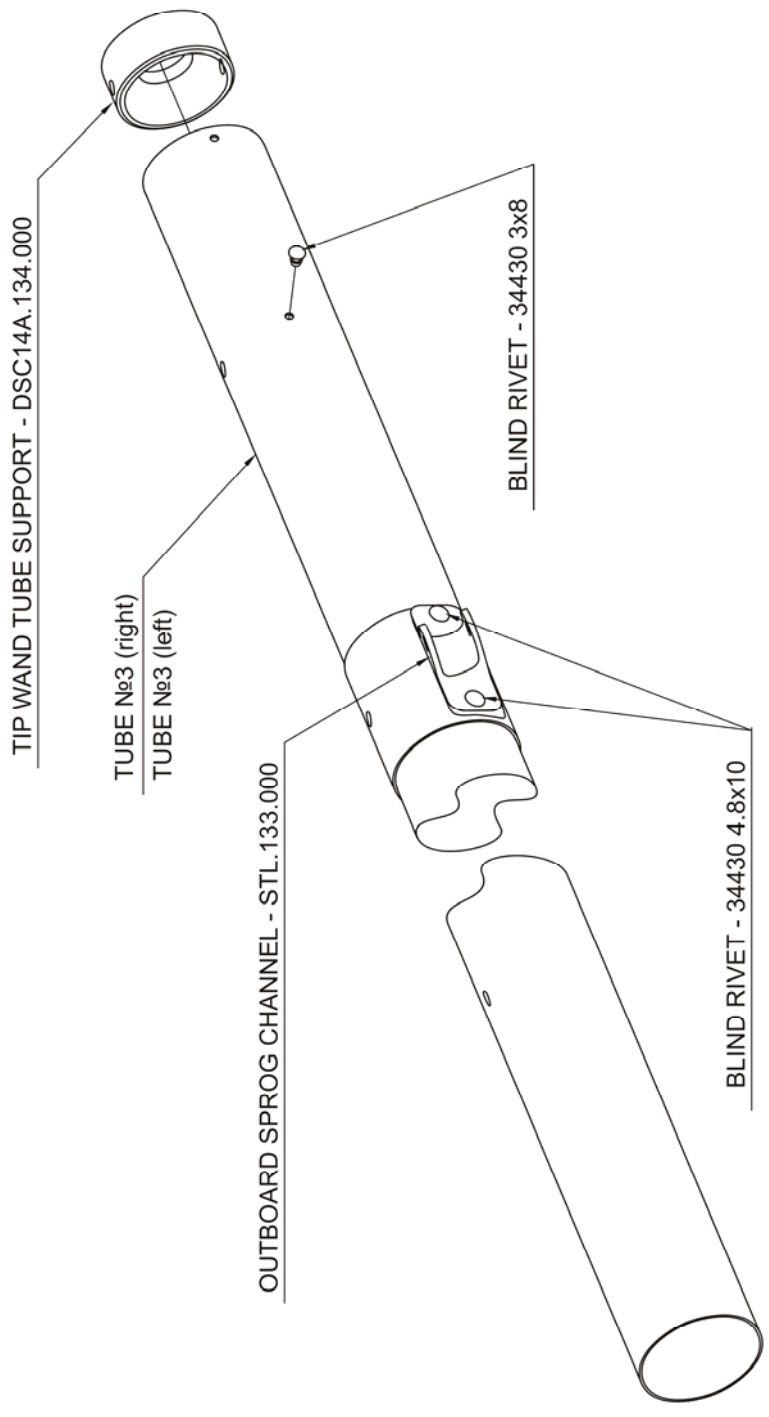
DSC...130.001.AD

LE TUBE №3 ASSEMBLED

DISCUS12A, DISCUS12B,  
DISCUS14A, DISCUS14B, DISCUS14L,  
DISCUS15A, DISCUS15B

Scale:





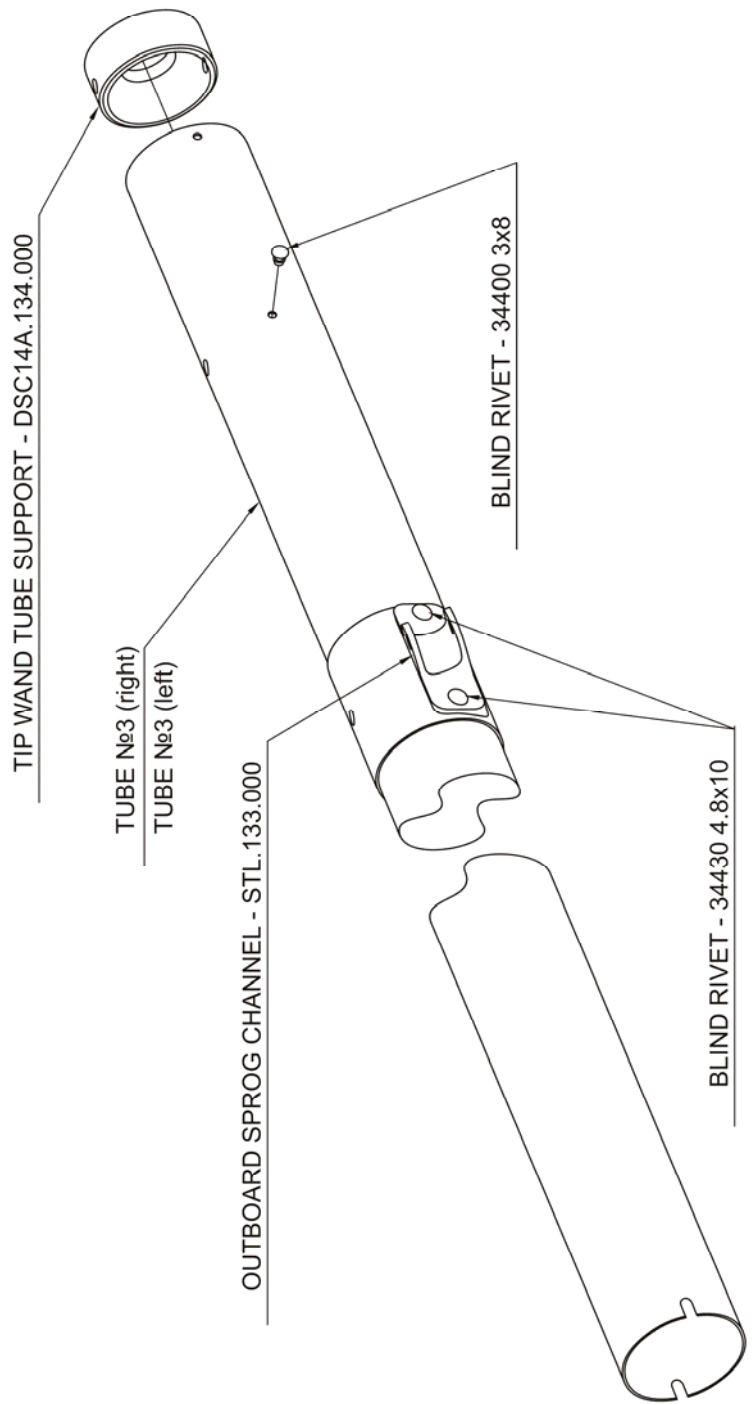
*right hand LE tube №3 - shown*  
*left hand LE tube №3 - mirror reflection*

**AEROS**

DSC...136.001.AD  
 LE TUBE №3

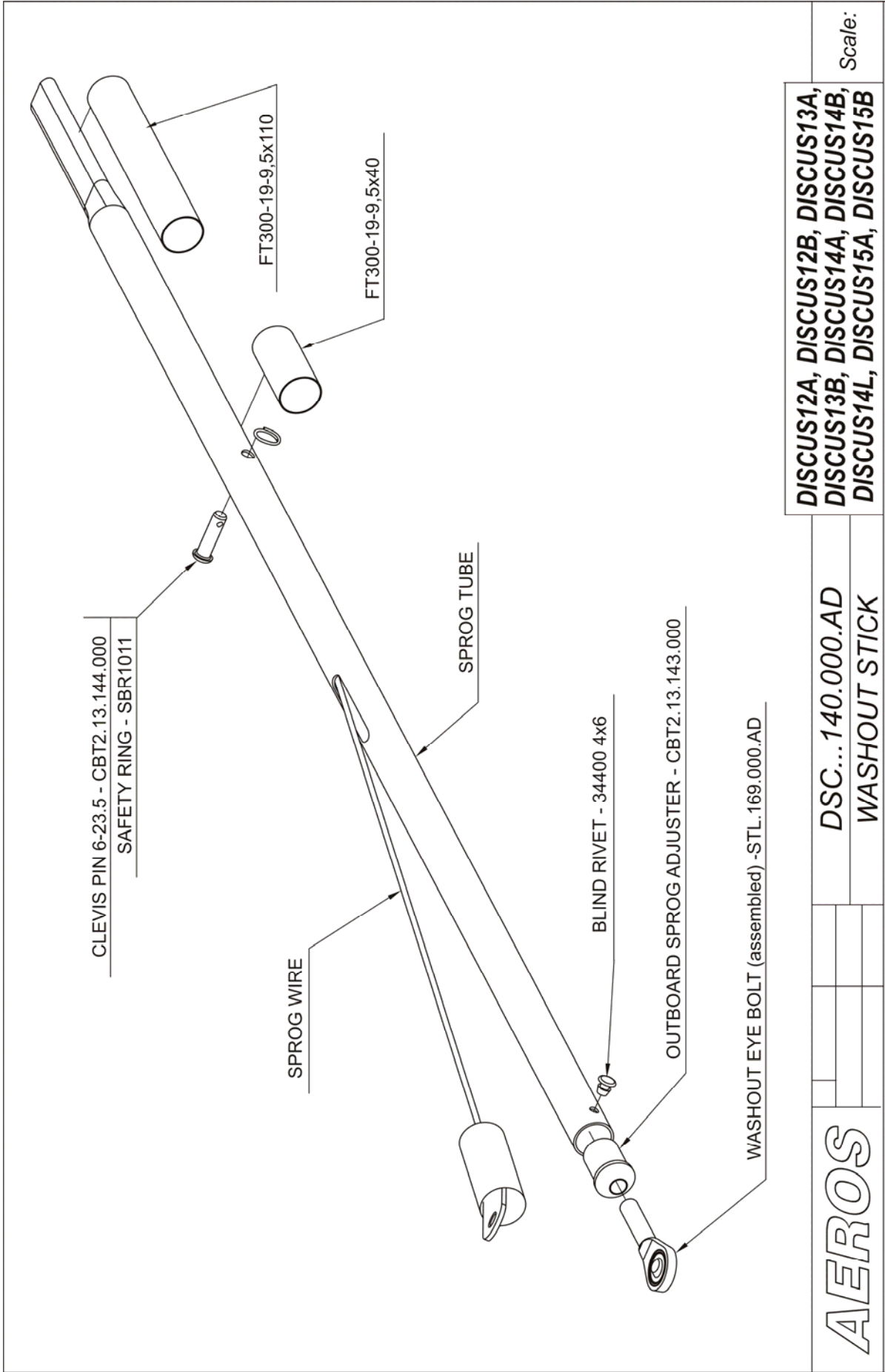
DISCUS12A, DISCUS12B,  
 DISCUS14A, DISCUS14B, DISCUS14L,  
 DISCUS15A, DISCUS15B

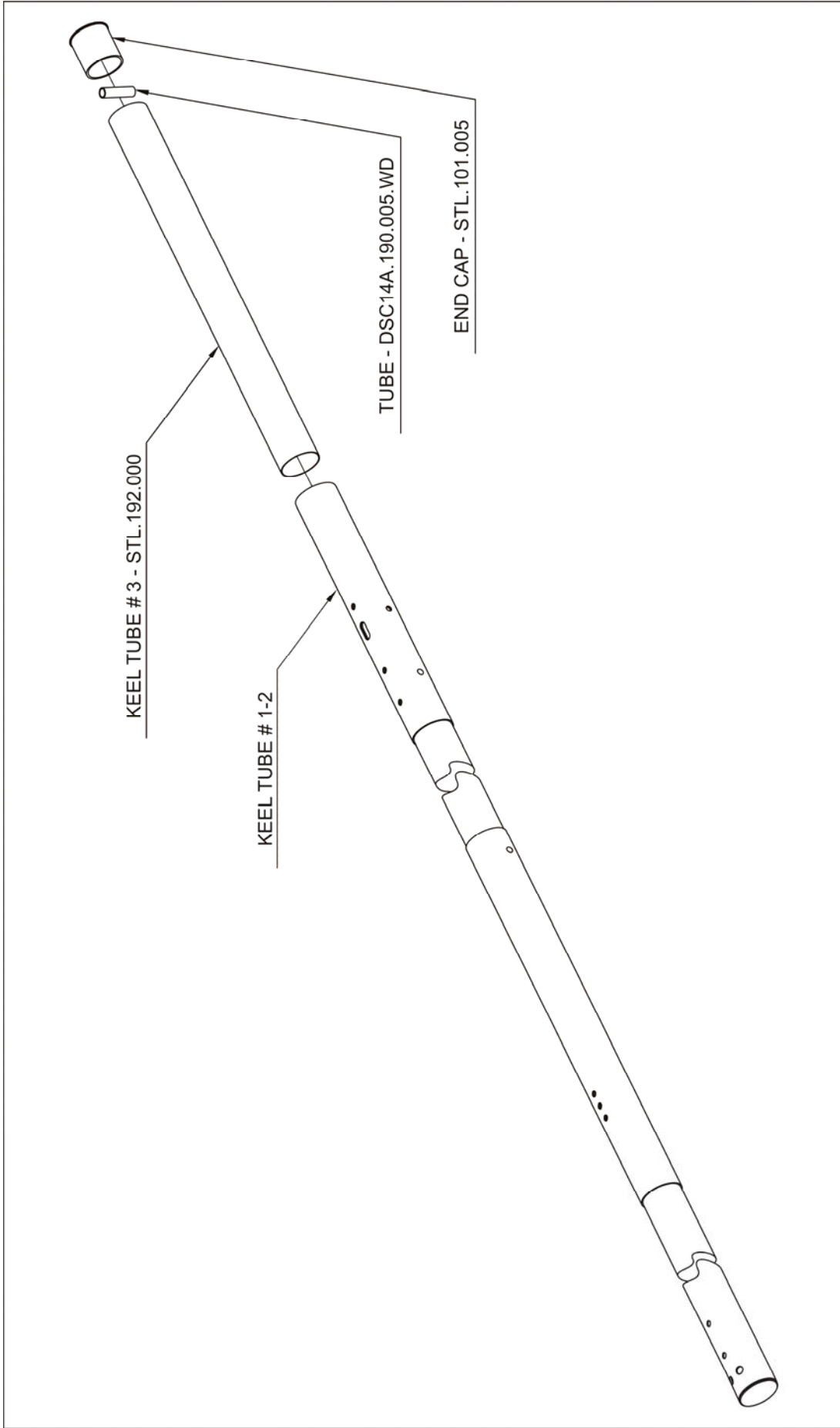
Scale:



*right hand LE tube №3 - shown*  
*left hand LE tube №3 - mirror reflection*

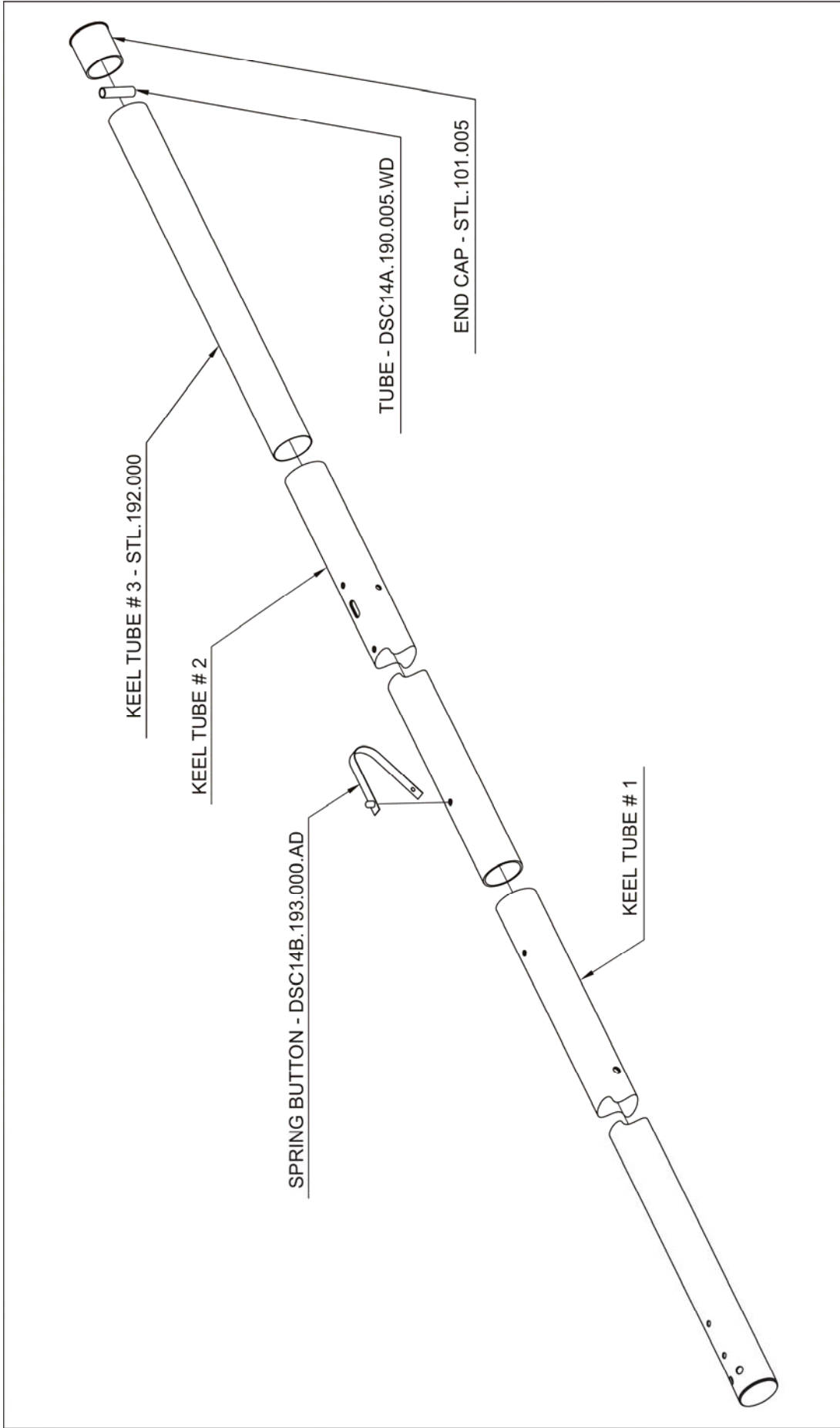
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	LE TUBE №3		





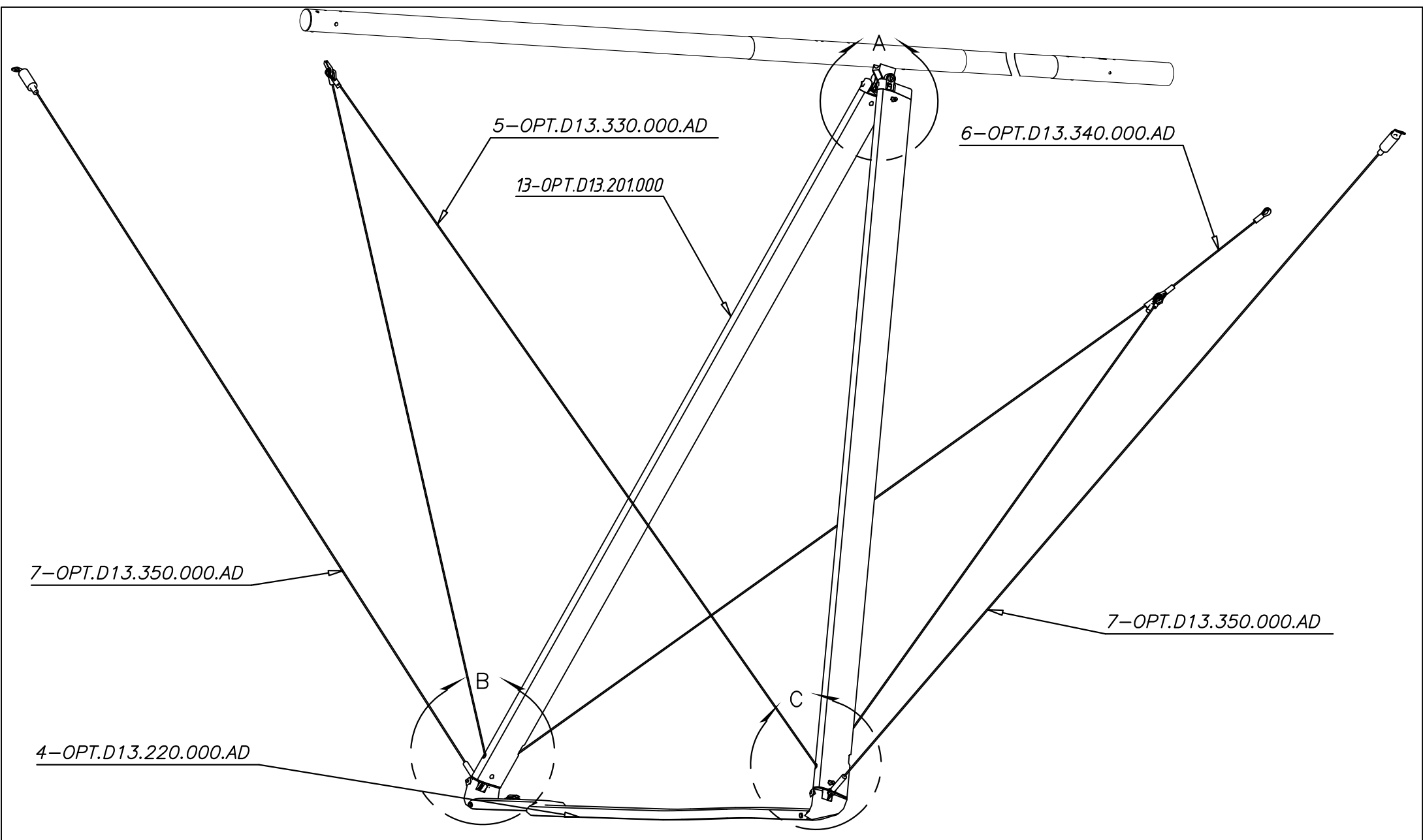
<b>AEROS</b>	DSC...190.000.AD	DISCUS12A, DISCUS13A, DISCUS14A, DISCUS14L, DISCUS15A	Scale:
	KEEL TUBE ASSEMBLED		



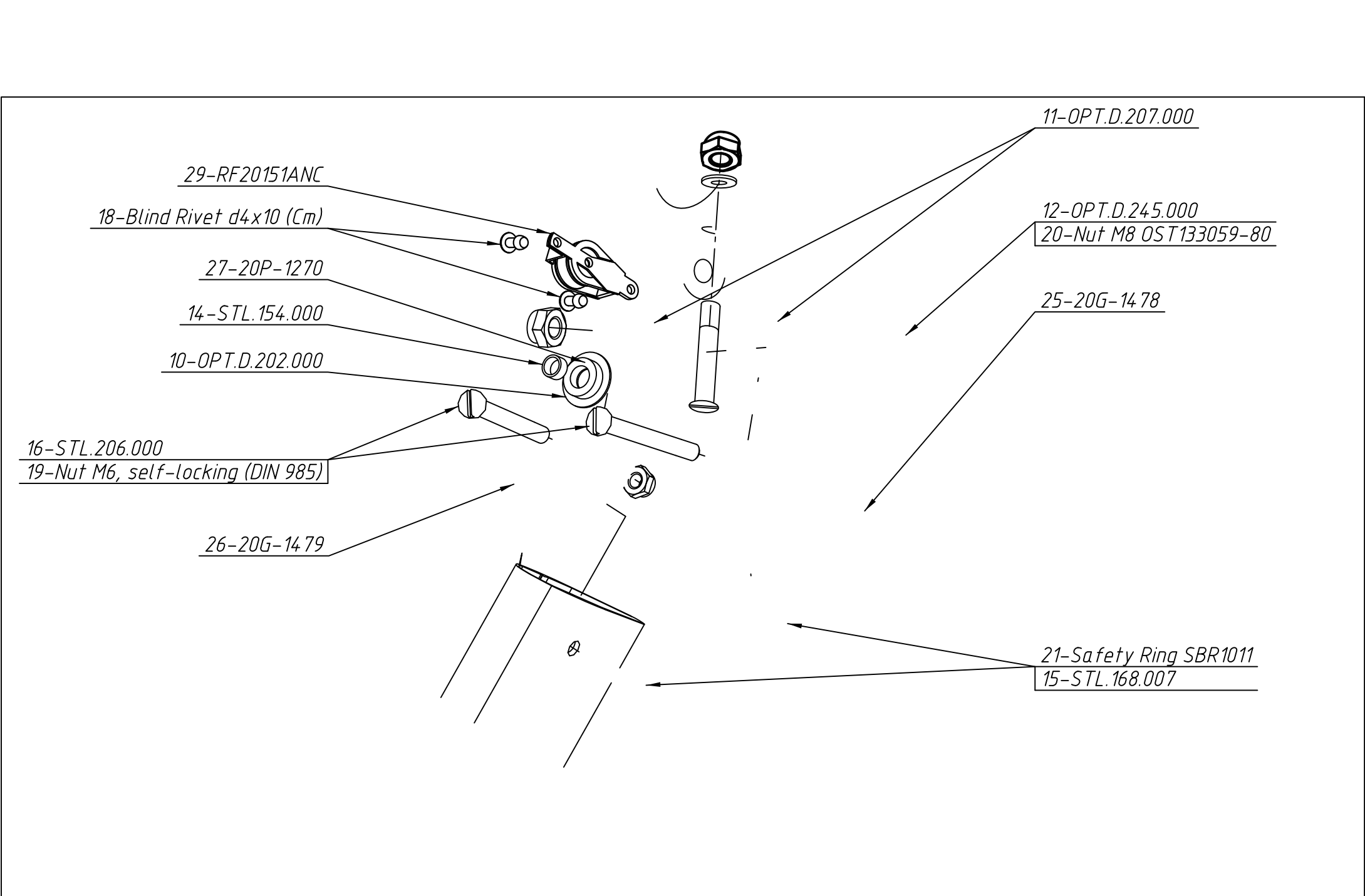


<b>AEROS</b>	DSC...190.000.AD	<b>DISCUS12B, DISCUS13B, DISCUS14B, DISCUS15B</b>	Scale:
	KEEL TUBE ASSEMBLED		





<b>AEROS</b>	by:	Date:	OPT.D13.200.000.AD	Scale:
	Zakidyshev	03.02.06	CONTROL FRAME WITH CABLES SET	



11-OPT.D.207.000

12-OPT.D.245.000

20-Nut M8 OST133059-80

25-20G-1478

21-Safety Ring SBR1011

15-STL.168.007

29-RF20151ANC

18-Blind Rivet d4x10 (Cm)

27-20P-1270

14-STL.154.000

10-OPT.D.202.000

16-STL.206.000

19-Nut M6, self-locking (DIN 985)

26-20G-1479

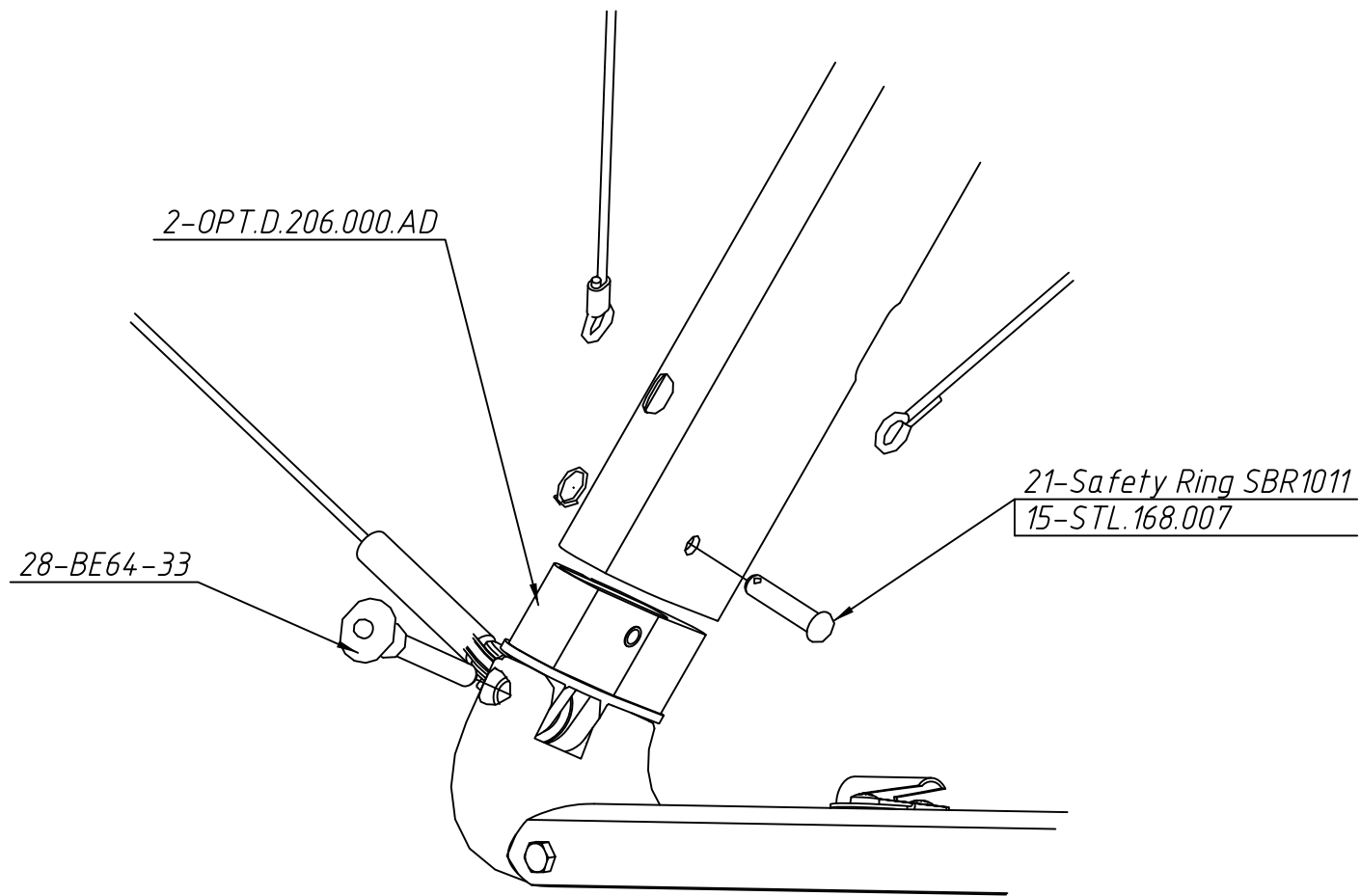
**AEROS**

by:	Date:
Zakidyshev	06.02.06

OPT.D13.200.000.AD

ZONE A

Scale:



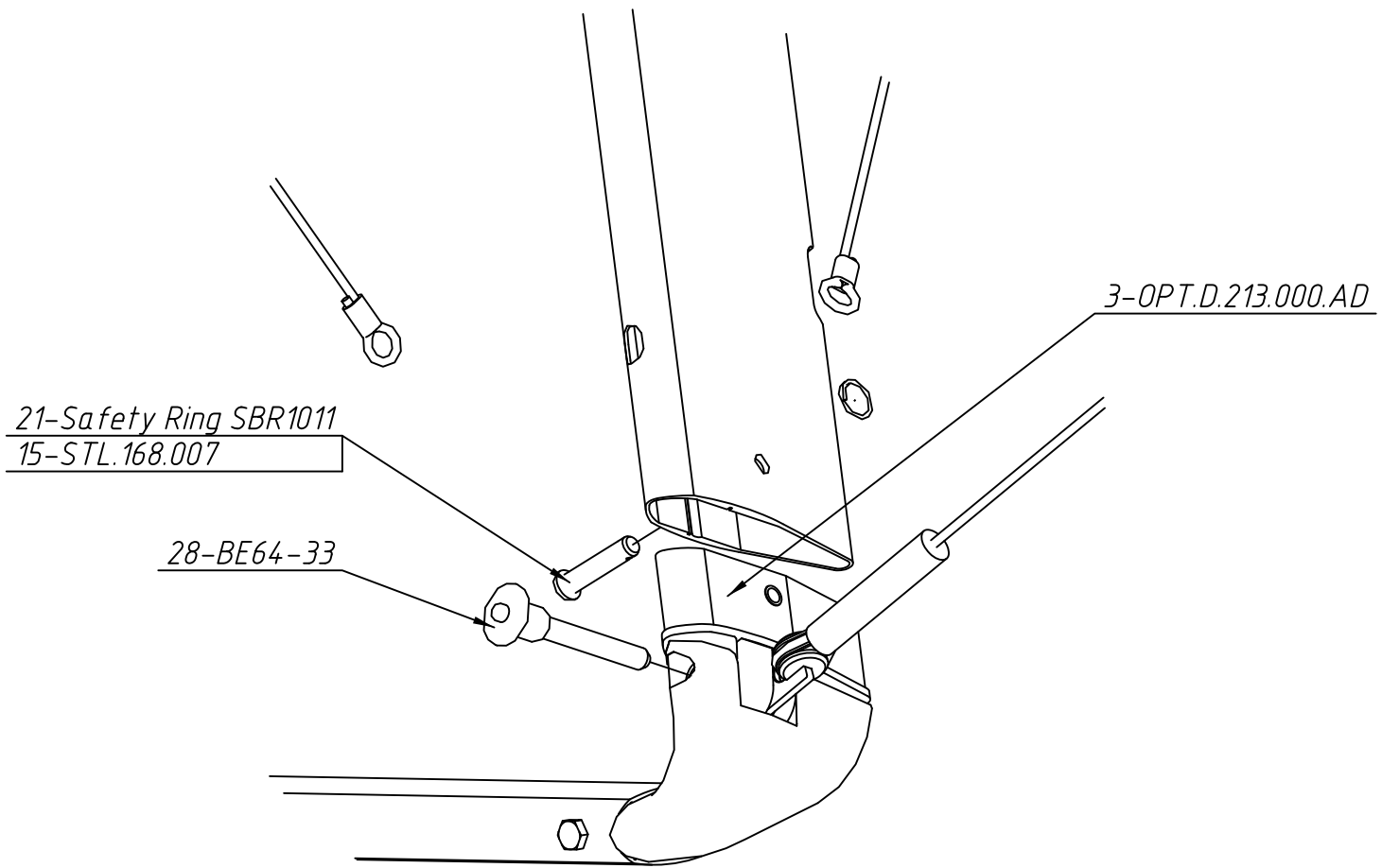
**AEROS**

by:	Date:
Zakidyshev	00.00.03

OPT.D13.200.000.AD

ZONE B

Scale:

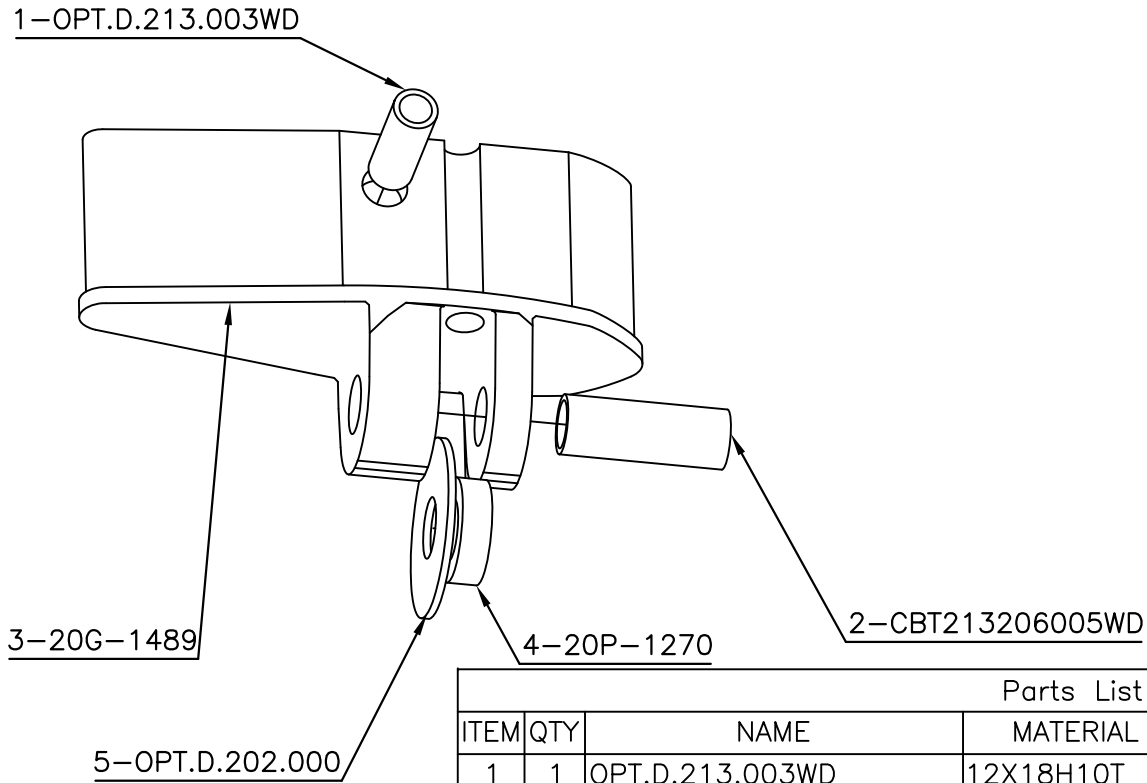


**AEROS**

by:	Date:
Zakidyshev	00.00.03

OPT.D13.200.000.AD
ZONE C

Scale:
--------



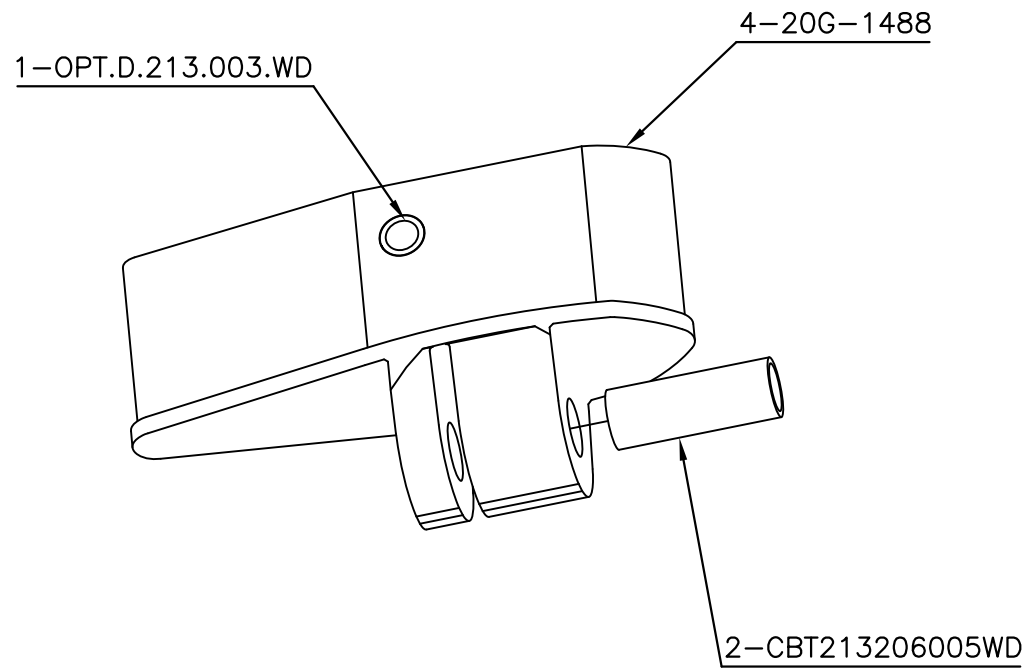
Parts List					
ITEM	QTY	NAME	MATERIAL	VENDOR	NOTE
1	1	OPT.D.213.003WD	12X18H10T ø6x0.8 L=19.7		BUSH
2	1	CBT213206005WD	12X18H10T ø8x0.8 L=21.6		BUSH
3	1	20G-1489	БАП10		RIGHT BOTTOM FITTING
4	1	20P-1270	PLASTIC-t		PULLEY
5	1	OPT.D.202.000	PLASTIC		WASHER

**AEROS**

by: *Zakidyshev*  
Date: *28.01.03*

*OPT.D.206.000.AD*  
*ASSEMBLED RIGHT BOTTOM FITTING*

Scale:



Parts List					
ITEM	QTY	NAME	MATERIAL	VENDOR	NOTE
1	1	OPT.D.213.003.WD	12X18H10T Ø6x0.8 L=19.7		BUSH
2	1	CBT213206005WD	12X18H10T Ø8x0.8 L=21.6		BUSH
4	1	20G-1488	BA110		LEFT BOTTOM FITTING

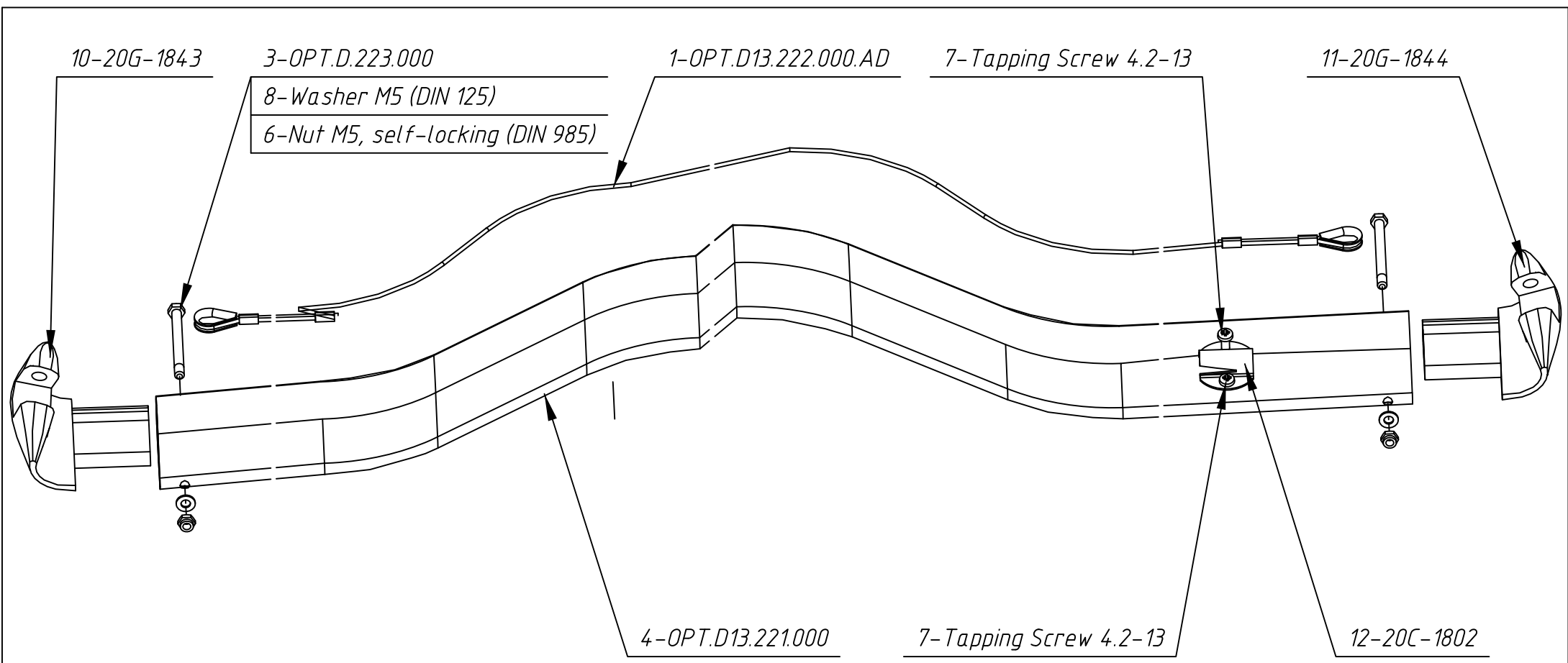
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by:	Date:
Zakidyshev	29.01.03

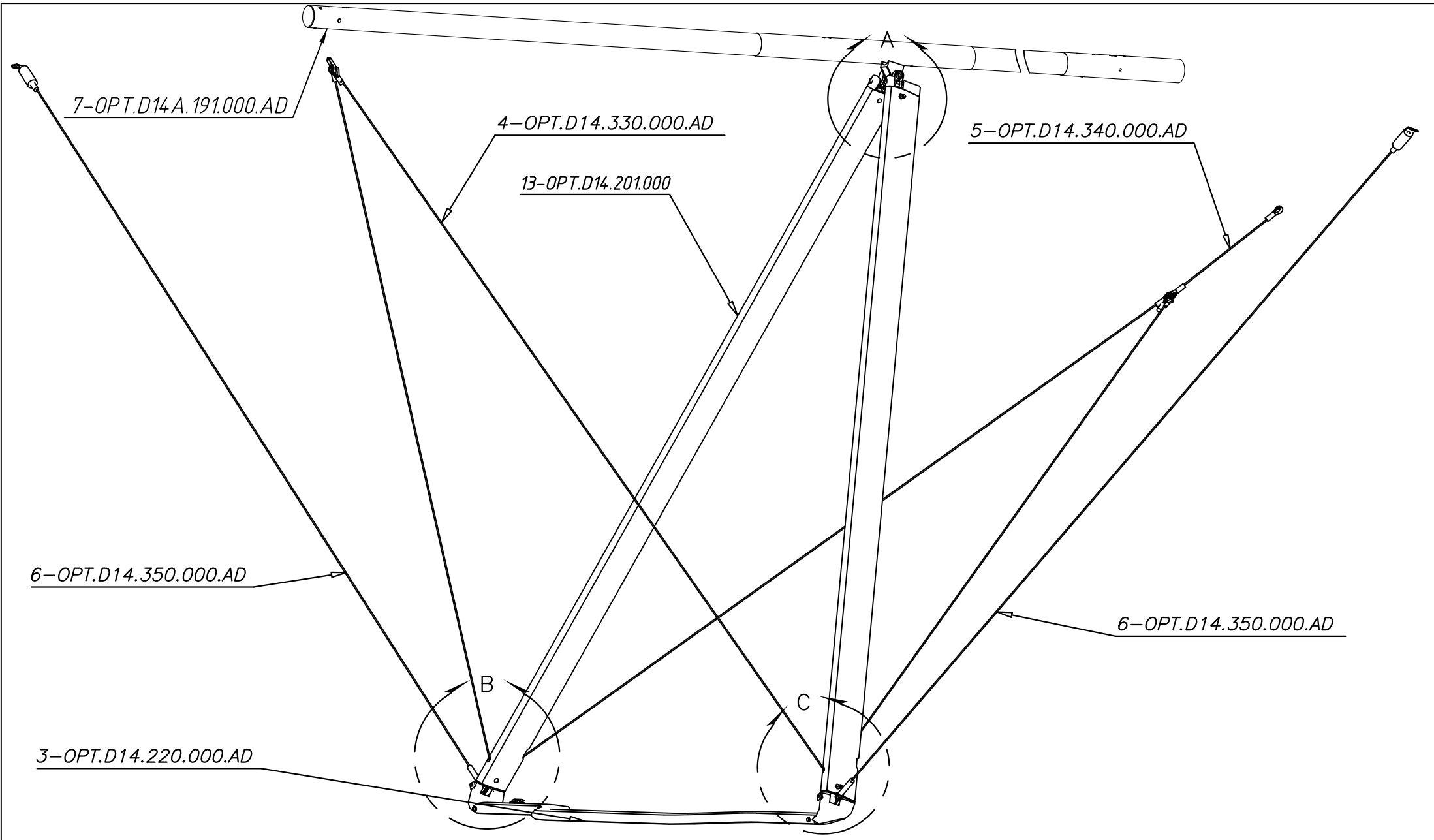
OPT.D.213.000.AD  
ASSEMBLED LEFT BOTTOM FITTING

Scale:

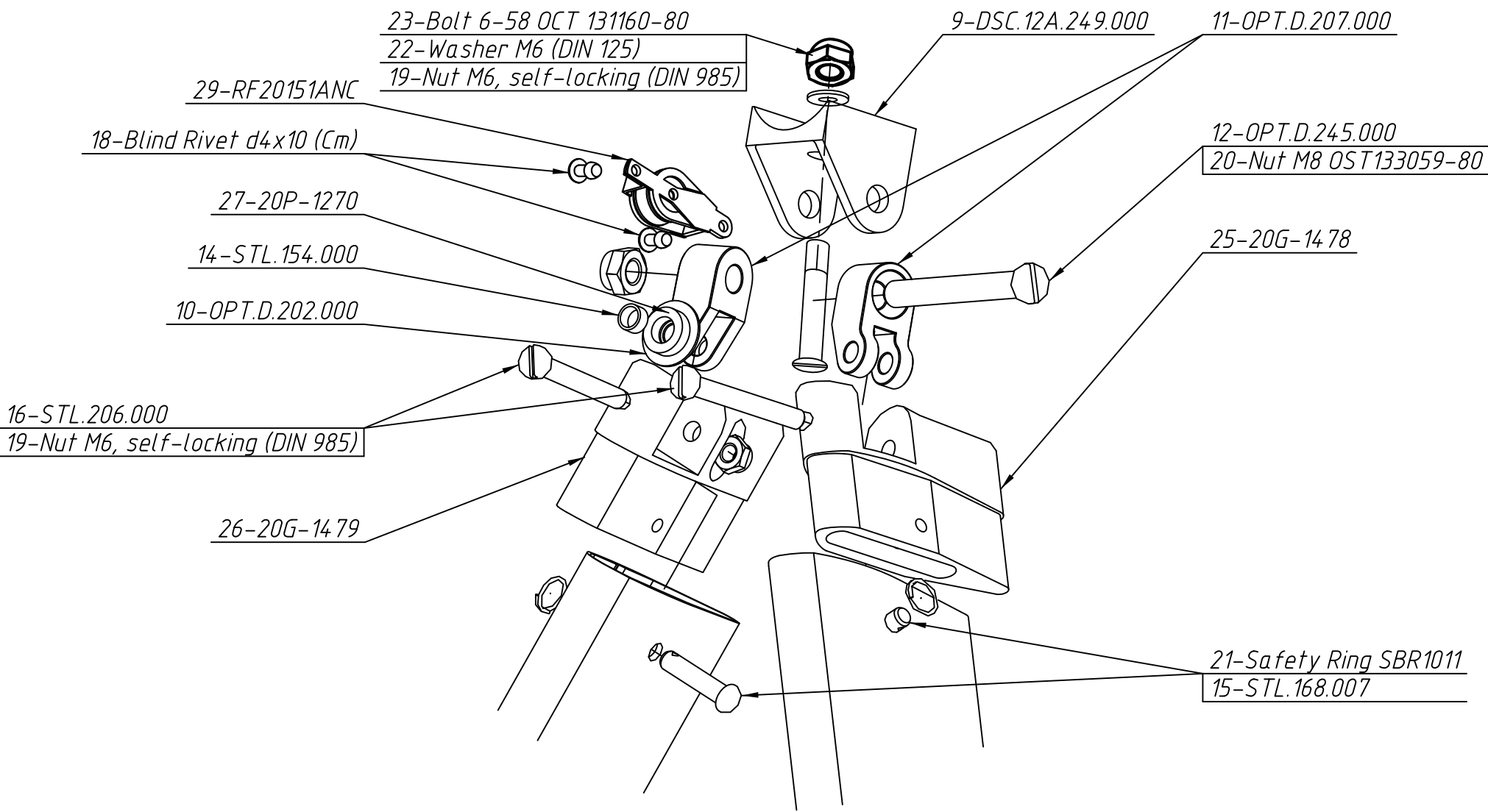




<b>AEROS</b>			OPT.D13.220.000.AD	Scale:
	by:	Date:		
	Zakidyshev	01.02.06	ASSEMBLED BASE BAR	



AEROS			OPT.D14.200.000.AD	
	by:	Date:		
	Zakidyshv	03.02.06	CONTROL FRAME WITH CABLES SET	Scale:

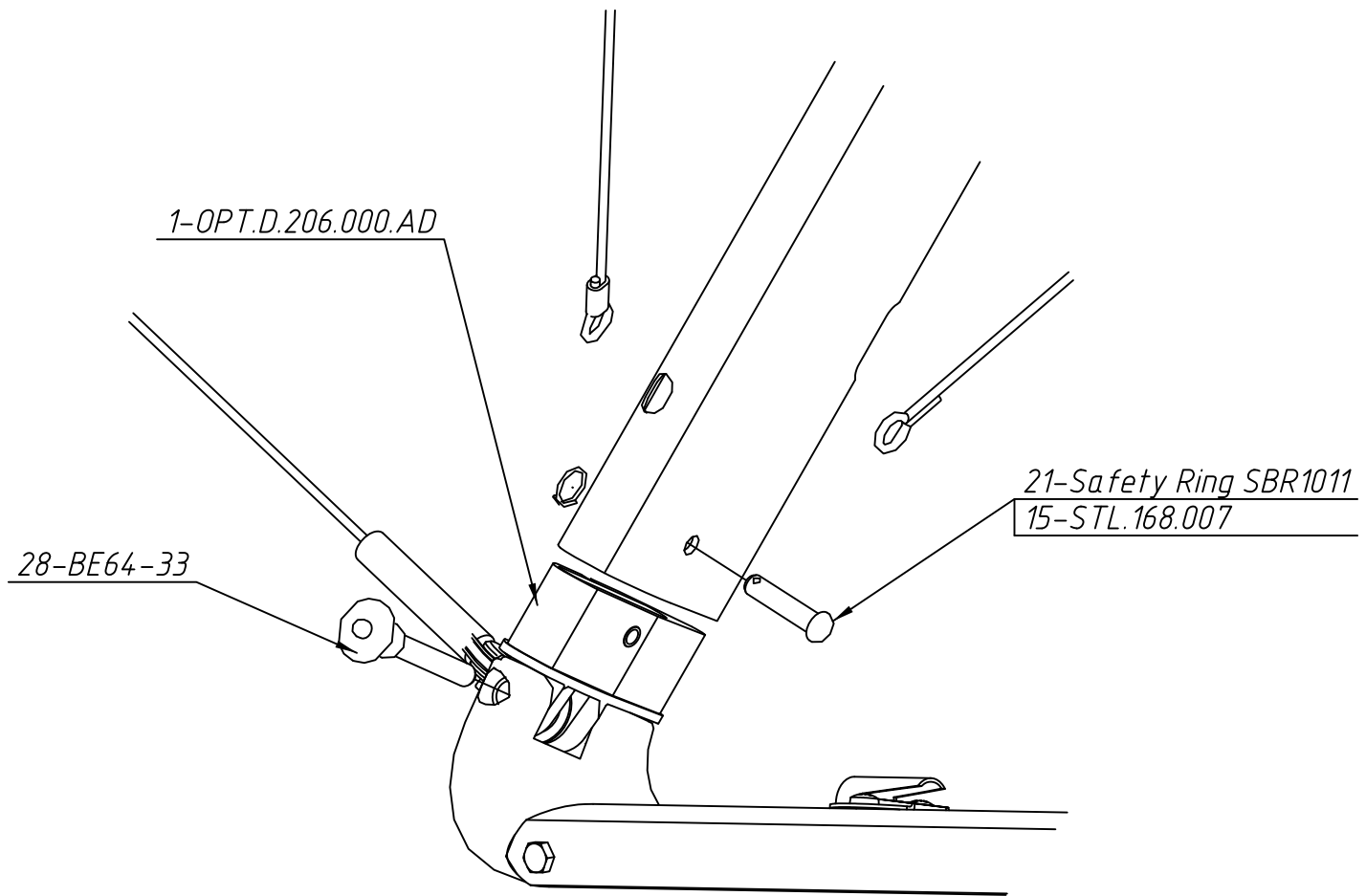


**AEROS**

by:	Date:
Zakidyshv	06.02.06

OPT.D14.200.000.AD  
 ZONE A

Scale:



**AEROS**

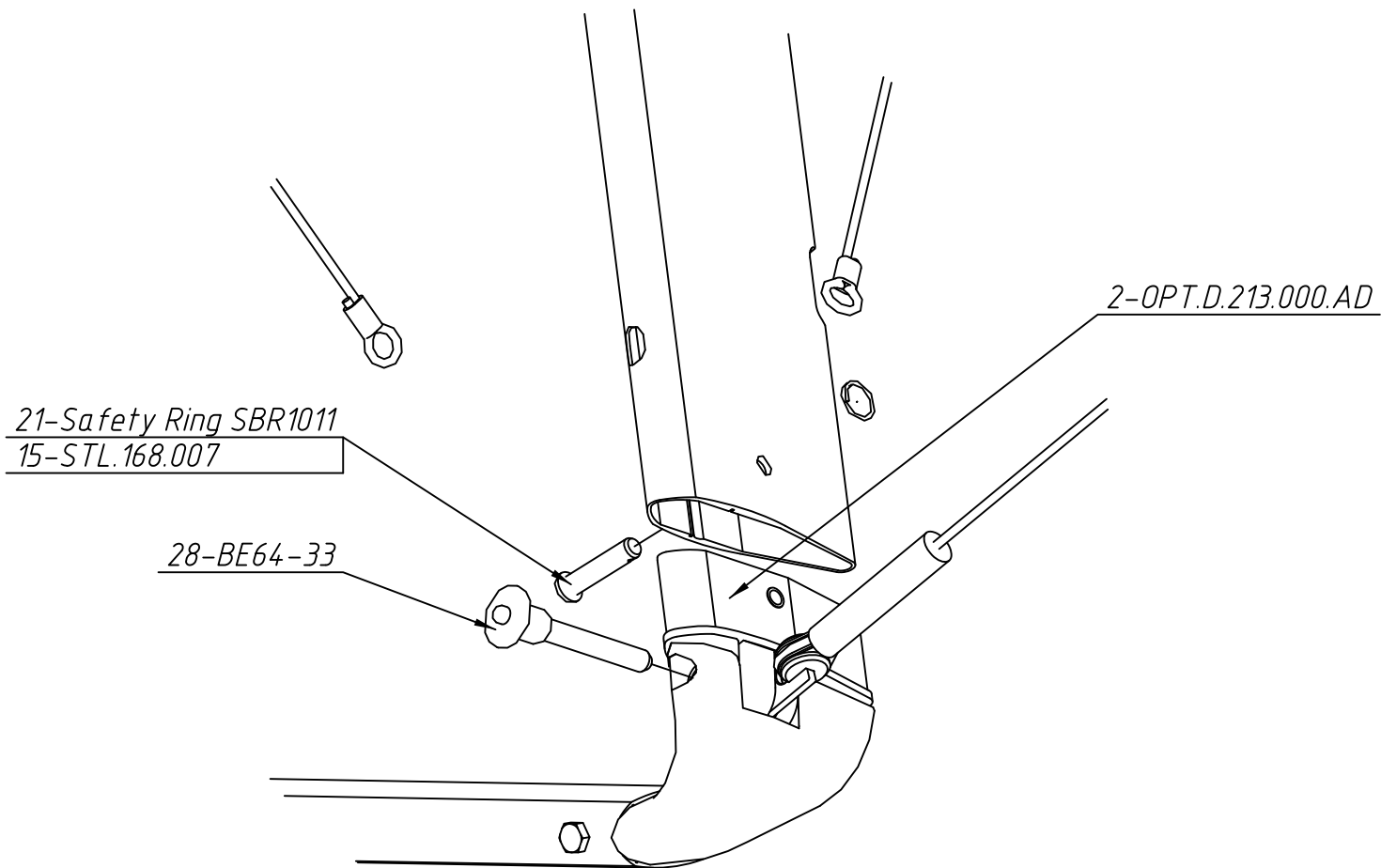
by:	Date:
Zakidyshv	00.00.03

OPT.D14.200.000.AD

ZONE B

Scale:

Scale:



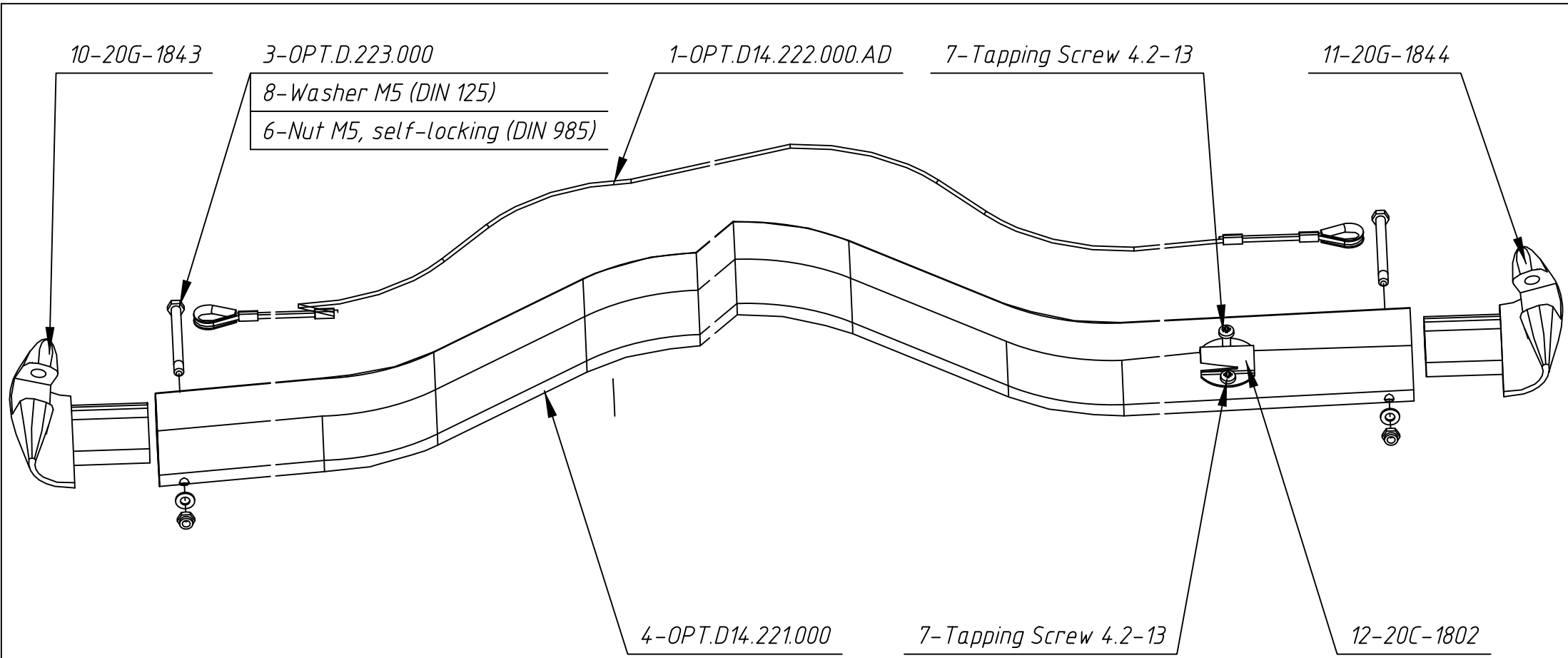
**AEROS**

by:	Date:
Zakidyshev	00.00.03

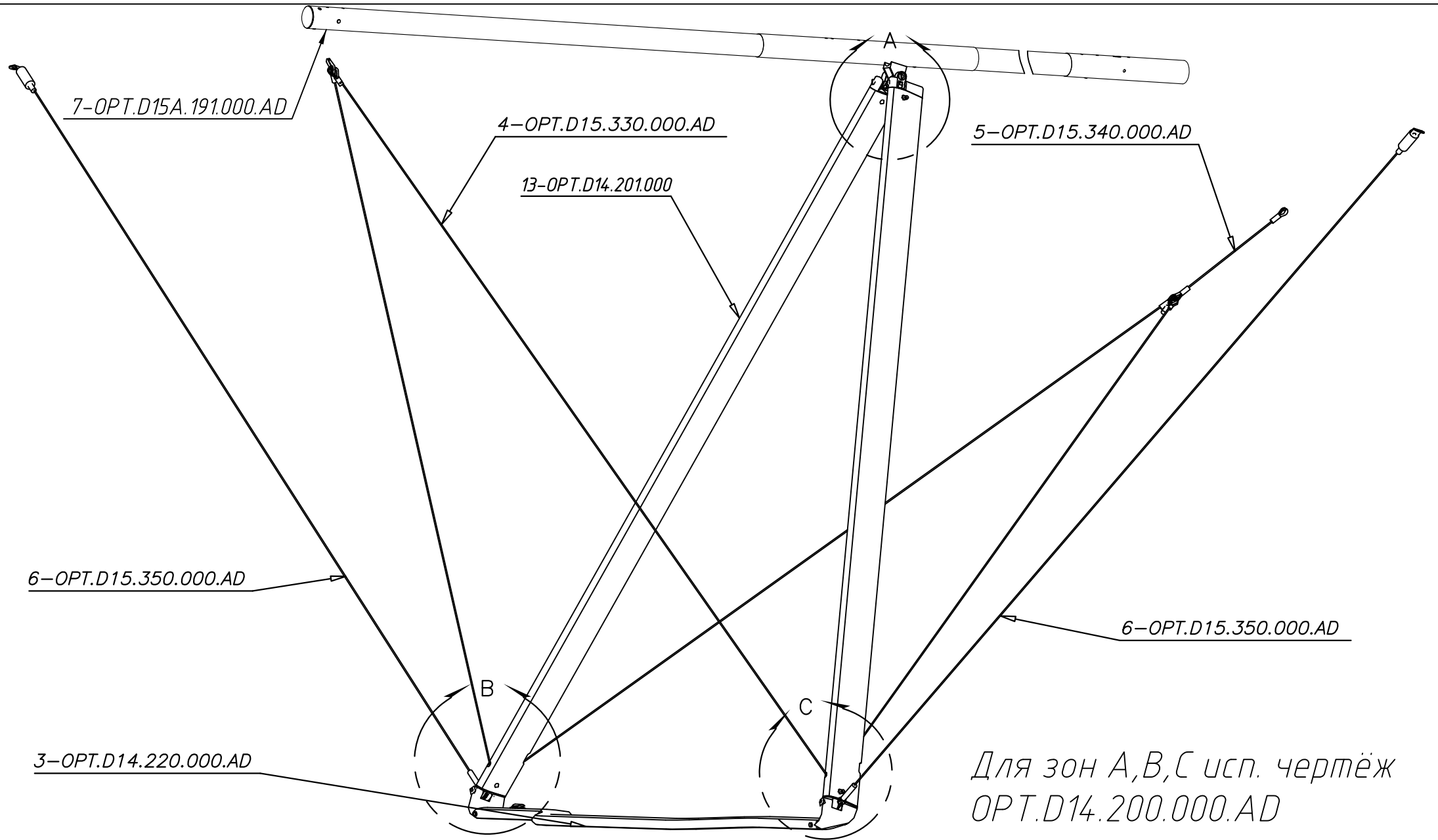
OPT.D14.200.000.AD  
ZONE C

Scale:

Scale:



<b>AEROS</b>			OPT.D14.220.000.AD	Scale:
	by:	Date:	ASSEMBLED BASE BAR	
	Zakidyshev	01.02.06		



**AEROS**

by:	Date:
Zakidyshev	03.02.06

OPT.D15.200.000.AD

CONTROL FRAME WITH CABLES SET

Scale: