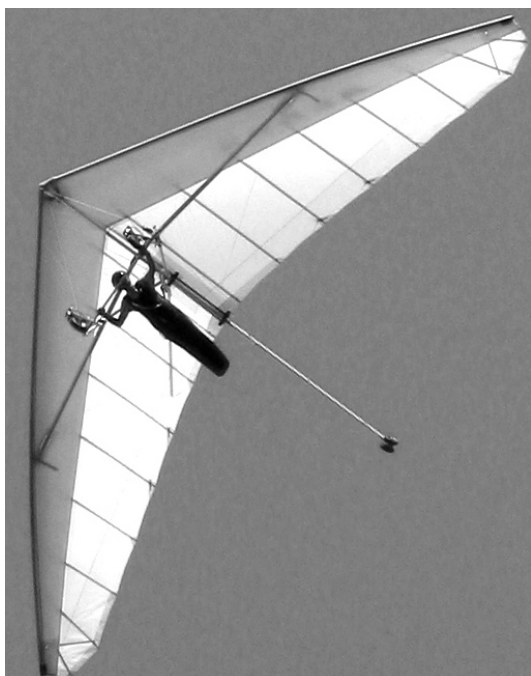


HANG GLIDER

TARGET-21

OWNER / SERVICE *MANUAL*

Ver. 2012.08.08



Date of production _____

Serial number _____

Manufactured by:
AEROS Ltd.,
Post-Volynskaya St. 5.,
Kiev, 03061,
UKRAINE

Tel: (380 44) 455 41 18

Fax: (380 44) 455 41 16

E-mail: aerosint@aerosint.kiev.ua, <http://www.aeros.com.ua>

Table of Content

Target 21 Owner / Service Manual

<i>Introduction.....</i>	3
<i>Technical Information and Operating Limitations</i>	3
<i>Target 21 Reassembly After Shipping and Breakdown for Shipping Procedures</i>	4
<i>Reassembling The Target 21 After Breakdown For Shipping.....</i>	4
<i>To Remove The Rear Leading Edges For Shipping.....</i>	5
<i>Target 21 Set-Up Procedure</i>	5
<i>Preflight Procedure.....</i>	9
<i>Laying the Glider Down Flat.....</i>	10
<i>Launching and Flying the Target 21</i>	10
<i>Speed to Fly</i>	11
<i>Trimming Your Glider in Pitch</i>	11
<i>Landing the Target 21</i>	11
<i>Target 21 Breakdown</i>	12
<i>Target 21 Stability Systems.....</i>	14
<i>Target 21 Reflex Bridle Adjustment.....</i>	14
<i>Maintenance.....</i>	15
<i>Removing the Sail from the Airframe and Re-Installing</i>	16
<i>Glider Tuning</i>	17
<i>Landing Gear Installation and Aerotowing the Target-21.....</i>	18-19
<i>In Closing - A Few Final Words on Your Safety.....</i>	20
<i>Schemes.....</i>	21

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 Target 21 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 Target 21 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.

	Target 21
Sail area, sq.m. (sq.ft.)	20.5(220)
Wing span, m (ft.)	10.8(35.4)
Aspect ratio	5.7
Nose angle, °	122
Pilot clip weight optim., kg (lb)	130 (289)
Weight (without bags), kg (lb) *	34 (75)
Number of upper sail battens	18
Breakdown length, m (ft) *	6.4/4.3
Tested load, G	+6 / -3
Wind speed max, m/sec (mph)	10 (22)
Min. airspeed, km/h (mph)	29-30 (18-19)
Va, km/h (mph)	70 (44)
VNE, km/h (mph)	81 (50)
Min. clip-in weight, kg (lb)	85 (189)
Max. clip-in weight, kg (lb)	190 (422)

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

The stability, controllability, and structural strength of a properly maintained Target 21 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 Target 21 outside of the above limitations may result in injury and death.

Flying the Target 21 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.

TARGET 21 REASSEMBLY AFTER SHIPPING AND BREAKDOWN FOR SHIPPING PROCEDURES

The front leading edge is 62 mm, with 60mm oversleeved with 62 mm at the crossbar junction. The rear leading edge is 50 mm oversleeved with 52 mm and slotted at the front end and oversleeved with 52mm at the washout tube "outboard sprog" attachment point. The rear end of the aft leading edge contains a slotted cap, secured in place by a small screw 10 mm from the end of the tube.

REASSEMBLING THE TARGET 21 AFTER BREAKDOWN FOR SHIPPING

1. Lay the glider down on its 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 its 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.

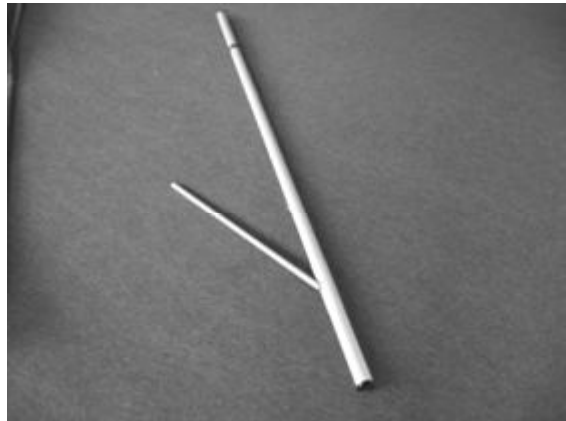


Photo 1

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. (The *photo 2* shows the left 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 bottom sail hole, and slide the rear leading edge into the front leading edge. Align the rear leading edge properly so that the sprog is on the inside of the leading edge, and slide the rear leading edge forward, rotating as necessary, until the slot in the rear leading edge engages securely into the pin 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 tip, find the sail mount strap and stretch it towards the aft end of the leading edge, using the handle on the mount strap. Position the sail mount strap to the end cap slot of the leading edge tube and make sure the sail is mounted properly. Close the safety Velcro (*Photo 3*).



Photo 3

5. Roll the sail tips 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.
2. Open the sail mount strap safety Velcro, using the handle, remove the sail mount strap from the end cap slot.
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 washout tips folded towards the nose pull the rear leading edge straight aft to disengage it from the front, and then slide it backward carefully out of the sail. 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.

TARGET 21 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 control bar. (Photo 5).

Install the quick pin bolt (from front to rear), securing the bracket to the control bar.

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. Pull out of the sail the pull back wires, check their proper position(Photo 6). Insert the kingpost bottom into corresponding place on the keel tube between the pull back wires, working through the kingpost hole in the upper sail, taking care that there is no twist in the upper wires(Photo 7).



Photo 6



Photo 7

6. 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 8). 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. 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 Target 21 is designated as the "No. 1" batten.

Install the cambered top surface battens in the sail, leaving out the shortest three on each side for now.

Install the batten tips into the hem of the trailing edge (Photo 9). Make sure the tips slide fully into the hem.



Photo 8

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 three 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.

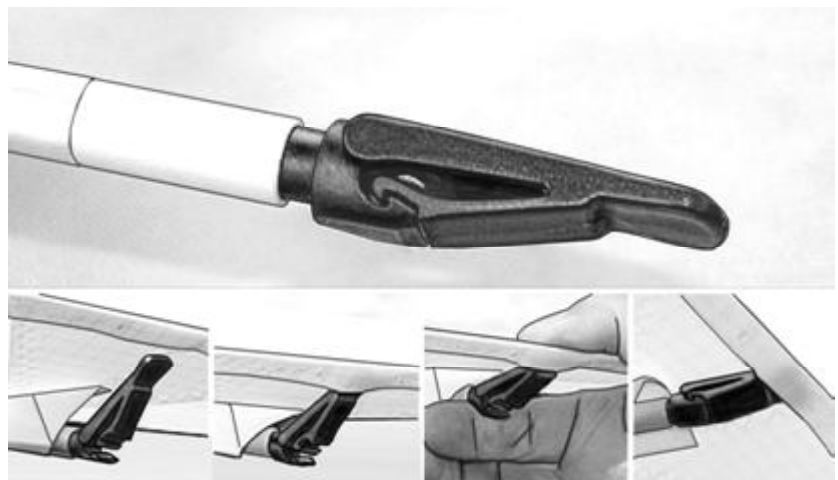


Photo 9

7. Spread the wings all the way and check all cables for any twisted thimbles or tangled cables. Take the shackle of the sweep (crossbar tensioning) wire. Pull the shackle out the trailing edge of the sail. 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

8. Attach the bottom front wires to the hook on the bottom nose plate (Photo 11).



Photo 11

9. Remove protective bags from the wing tips. Install the last three outboard top surface battens. Engage the remaining batten tips in the trailing edge at this time. (Photo 12).

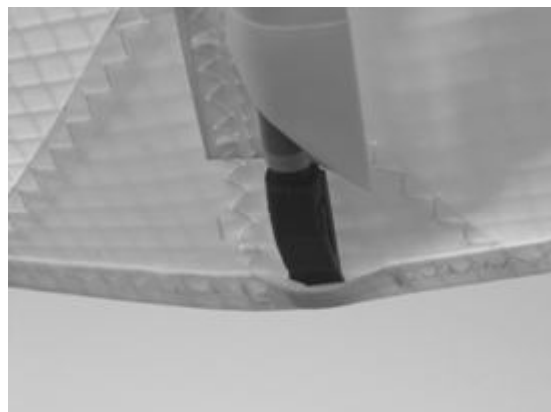


Photo 12

12. Install the plug-on battens. Insert one end of the batten into the batten pocket .This end plugs onto the hook on top of the leading edge, and the batten string is secured double purchase to the other end. (Photo13)



Photo 13

13. The next step is to mount the outboard washout tips. (Photo 14)



Photo 14

14. 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 15).

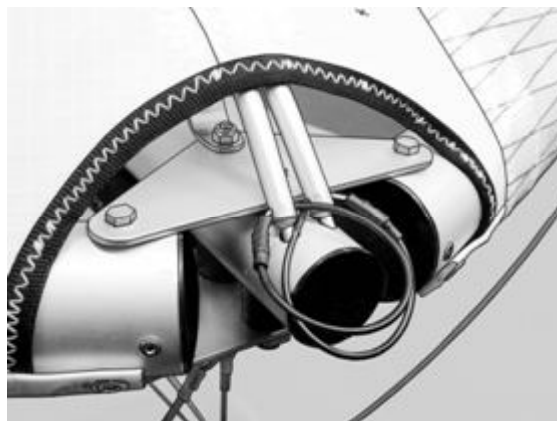


Photo 15

15. 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, safetyring, 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 sail mount strap is mounting in the end cap slot and the safety Velcro 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 washout tip is properly secured in position.

Check that the bridles are properly engaged (*Photo 16*).



Photo 16

From the rear keel:

Check that the sweep wires are tight and secured on the hook on the keel tube.

Check the kingpost base, the sweep wires have to go around the kingpost tube. (*Photo 17*).

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

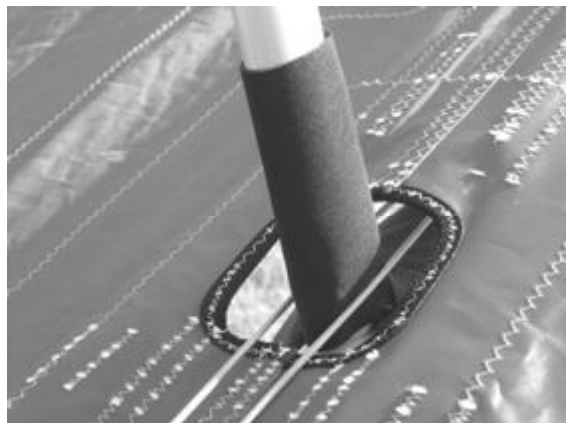


Photo 17

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.

Check the sweep wire for wear where it passes around the kingpost (*Photo 18*).

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 devis pin safeties, the control bar top plug bolt and nut.



Photo 18

Check the main and backup hangbops, that they are properly installed in the proper position and that they are in good condition (*Photo 18*).

At the nose: Check the security of all nuts at the noseplate, and check the top front wire.

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. Rock the glider forward so that the basetube folds rearward and underneath the glider as you gently lower the glider to the ground.

Reverse the procedure to set the glider upright again.

LAUNCHING AND FLYING THE TARGET 21

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. Use the both hang loops for the pilots hanging!

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 Target 21 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. 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.

SPEED TO FLY

The range of **trim speed** for the Target 21 is 30 - 37 km/h (19-23 mph)(depends on the hook-in weight). The speedbar position in front of the pilots face corresponds to this range.

The range of the **stall speed** for the Target 21 is 27 –30 km/h (17-19 mph)(depends on the hook-in weight). The glider is stable at the beginning of stall. While pushing out the basebar, the bar pressure is progressive.

The Target 21 speeds up to 75 km/h (47 mph), being essentially roll neutral, with no tendency to yaw. The bar pressure is mild, but progressive and consistent.

TRIMMING YOUR GLIDER IN PITCH

Target-21 pitch is very well defined, and the pitch force increases quickly 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. Since the Target-21 performs best at speeds relatively close to VMS, it is usually best to trim the glider at between minimum speed airspeed and perhaps 5 km/h (3 m.p.h.) above that.

On the Target 21, hang loop fore and aft position is adjusted by repositioning the hang bops on the keel. Hang loop fore and aft position is adjusted by moving the holding belt with the Velcro (and with the hang loops inside) along the keel tube upper surface at the desired position.

LANDING THE TARGET 21

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 19

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 19*). 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.

TARGET 21 BREAKDOWN

Breakdown of the glider is the reverse of assembly.
Set the glider at 90 degrees to the wing direction.

1. Remove the nosecore. Remove any instruments.
2. Detach the bottom front wires at the noseplate. (Photo20)
3. Put out the washout tips.
4. Remove the three shortest cambered battens.

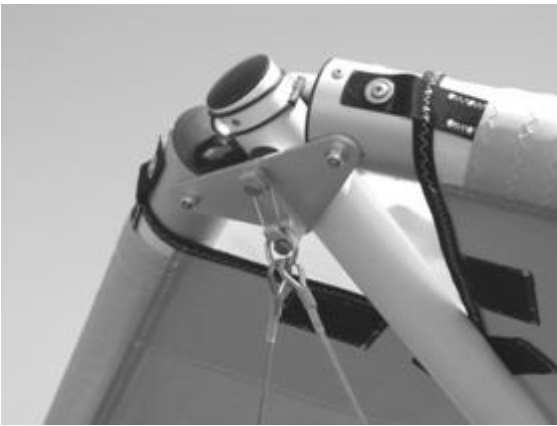


Photo 20



Photo 21

5. Fold the sail at the wing tips and put on the tip cover bags. (Photo21)

6. De-tension the crossbar sweep wire and let the wings fold in slightly.

7. Remove the remaining top surface battens.

8. Take off the kingpost bottom from the base on the keel tube.
Lay the kingpost down forward against the keel. (Photo22)

9. 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. 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 22



Photo23

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 23).

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:

Working from the trailing edge, roll the sail tightly to the leading edge and install the tip cover bag. (Photo 24)



Photo 24

12. 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 25).



Photo 25



Photo 26

13. Put the battens in the batten bag and stow it in the front of the glider. Install the sail Velcro around the sail forward of the control bar apex, and stow the nosecone between the leading edges (Photo 26, 27).

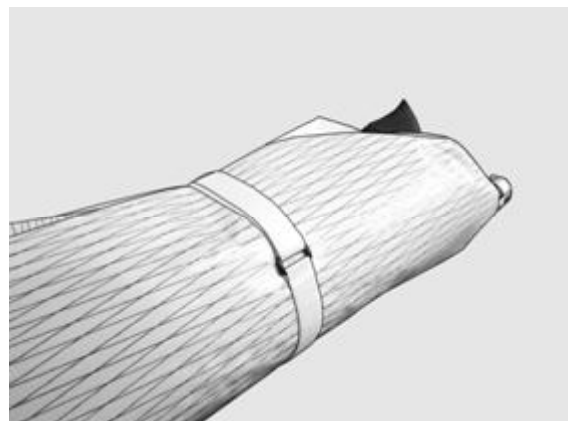


Photo 27

14. Install the glider bag. Flip the glider over onto the ground. Detach the basebar. Put the basebar in the bag and stow it in the rear of the glider between the leading edges. (Photo 28).

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 .

16. Zip up the glider bag.



Photo 28

TARGET 21 STABILITY SYSTEMS

Several design features of the Target 21 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.
- Washout tips, and the height at which they support the trailing edge.
- The shape of the preformed batters .

Correct attachment and proper adjustment of the bridles are critical to providing adequate stability at low angles of attack, particularly those below the normal operating range. The washout tips are adjusted at the factory to their proper settings.

TARGET 21 REFLEX BRIDLE ADJUSTMENT

On the Target 21 glider the bridles are checked by measuring the supported height of the sail above the keel. The glider must be fully assembled as if it were to be flown in order to measure the bridles. String a light-weight piece of thread from the rear tip of each bridle batten, across the corresponding batten on the other wing. The height in mm of this thread above the keel should be as follows:

Btn #3	Btn #4	Btn #7
80mm	100mm	100mm

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 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").

2. 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.

3. 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.

4. Inspect all bolts for tightness, all safeties for proper installation and possible damage. Inspect plates and fittings for damage, holes in tubes for elongation.

5. Inspect the sail for wear, tears, UV damage, loose stitching, etc.

6. Disassemble basebar corner assemblies. Inspect the hardware fittings. Replace any component with indications of permanent deformation or other damage.

7. 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.

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.

2. Anytime you have the sail off the frame inspect all of the batten pockets and batten pocket terminations.

3. Replace bottom side wires and hang loops.

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 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.

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. 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. Unbolt the upper front wire from the noseplate and feed it through the hole and out of the sail.
3. Spread the wings slightly, undo the Velcro tabs inside the rear ends of the leading edge and then dismount the sail from the rear leading edges.
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 rear flying wires from the rear keel.
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.
6. Unbolt the downtubes from the apex fittings (two 6 mm bolts). Set the control frame aside.
7. Turn the glider over. Unroll the sail until you can reach the bridle attachments at the trailing edge and disconnect the bridles from the sail. Set the kingpost aside.
8. Disassemble the crossbar-LE tube junctions. Disconnect the support belt at the crossbar center junction (which goes around the keel tube) from one side. Set the crossbar aside. (*Photo 29, 30*)

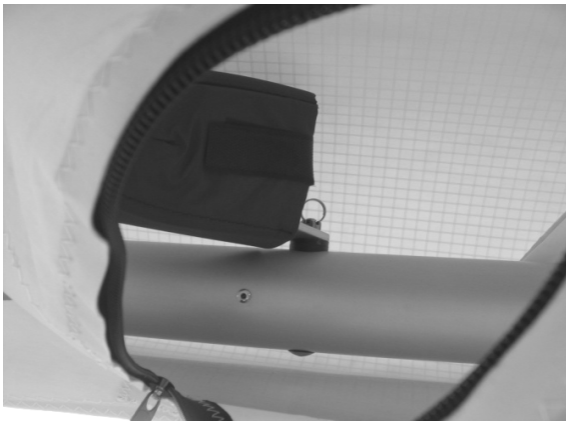


Photo 29



Photo 30

9. Slide the frame out through the nose of the glider. If you encounter resistance, stop and find out what's hanging up.

10. If you need to send the sail in to the factory for repair, remove the Mylar. 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.

11. 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. 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.

3. The frame is most easily inserted without the rear leading edges installed.

4. 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 leading edge tubes into the sail through the nose, 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. The keel tube has to go into the keel pocket. 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.

5. Position the crossbar with the X-bar-LE junction plates facing up and insert it between the keel tube and the sail.

6. Fix the crossbar central junction support belt at the crossbar (around the keel) with the screw.

7. Bolt the X-bar-LE junctions

8. Install the rear leading edges (see the section on re-installing the rear leading edges after shipping at the beginning of this manual.)

9. Install the control frame.

10. Working through the crossbar cut out hole, insert the top wires through the holes in the sail, making sure that no cable is wrapped around a leading edge or crossbar, and that no thimbles are cocked or twisted. Bolt the upper and bottom side wires.

11. Mount the sail mount webbing anchor straps over the rear leading edge endcaps. Make sure you mount the inner webbing loops in the endcap slots, not the outer "handle" loops! Make sure that the webbing lies flat and smooth in the slot, and that the sail is properly aligned when mounted. Secure the Velcro retainer tabs.

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 rear wires to the rear of the keel, attaching the rear sail mount at the same time.

14. Flip 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.

Reinstall the nose screws after the sail is fully spread.

16. Connect the bridles to the sail.

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.

TUNING

TURN TRIM

Turns are caused by asymmetry in the glider. If you have a turn, first try to make the glider symmetrical in every way.

AIRFRAME

Check the leading edges for possible bent tubes. Check that the keel is not bent to one side. Check for symmetry in the alignment of the sail mount plugs.

BATTENS

Check the battens for symmetrical shape and batten tension.

SAIL MOUNT PLUGS ADJUSTING

After you have made everything symmetrical, if you still have a turn, you will correct it by rotating one or both sail mount plugs. A left turn is corrected by twisting the left sail plug clockwise (twisting the sail down at the trailing edge) or twisting the right sail plug clockwise (twisting the sail up at the trailing edge) or both.

Twist counter clockwise on either or both to correct a right turn.

LANDING GEAR INSTALLATION

1. Install the main landing gear on the base tube, sliding the base tube inside plastic bushings of each gear. (Photo 32)



Photo 32

It is recommended to perform this procedure before rigging the glider. However, if the glider is already rigged you can simply detach the base tube from the control frame before the main landing gear installation. (Refer to the section TARGET 21 SET-UP PROCEDURE, paragraph 3 for proper base tube installation).

2. Attach the tail wheel extension with the tail wheel to the keel tube and secure it with the clevis pin and a safety ring. (Photo 33)



Photo 33

3. Bolt the tail wheel rear wires on place and tighten the joint with the lock nut. (Photo 34)



Photo34

4. Tie the bungee cord around the down tube and the landing gear chock absorber arm as shown on the pictures. The bungee cord will work as a chock absorber during take offs and landings. Tie a safety rope around the down tube and the chock absorber arm. Leave necessary slack when tying the rope which is necessary for the bungee of the chock absorber to stretch. (Photos 35, 36)



Photo 35



Photo 36

Now your glider is ready for aerotowing.

AEROTOWING THE TARGET 21

Target21 equipped with a landing gear can be successfully aerotowed using proper procedures and taking special care. It is highly recommended that Target21 is to be flown by highly experienced instructor in command at aerotow. Included are only some most important safety tips which we consider essential to highlight.

Prior to flight a thorough pre flight inspection of the glider with the landing gear should be carried out.

Connect the release system to inner shoulder straps of both pilots.

To reduce pressure from the base tube during aerotow we recommend using a special release system bridle connected to the pilot and to the keel tube. Moving the release system connection along the keel tube forward reduce the base tube pressure in flight during aerotow.

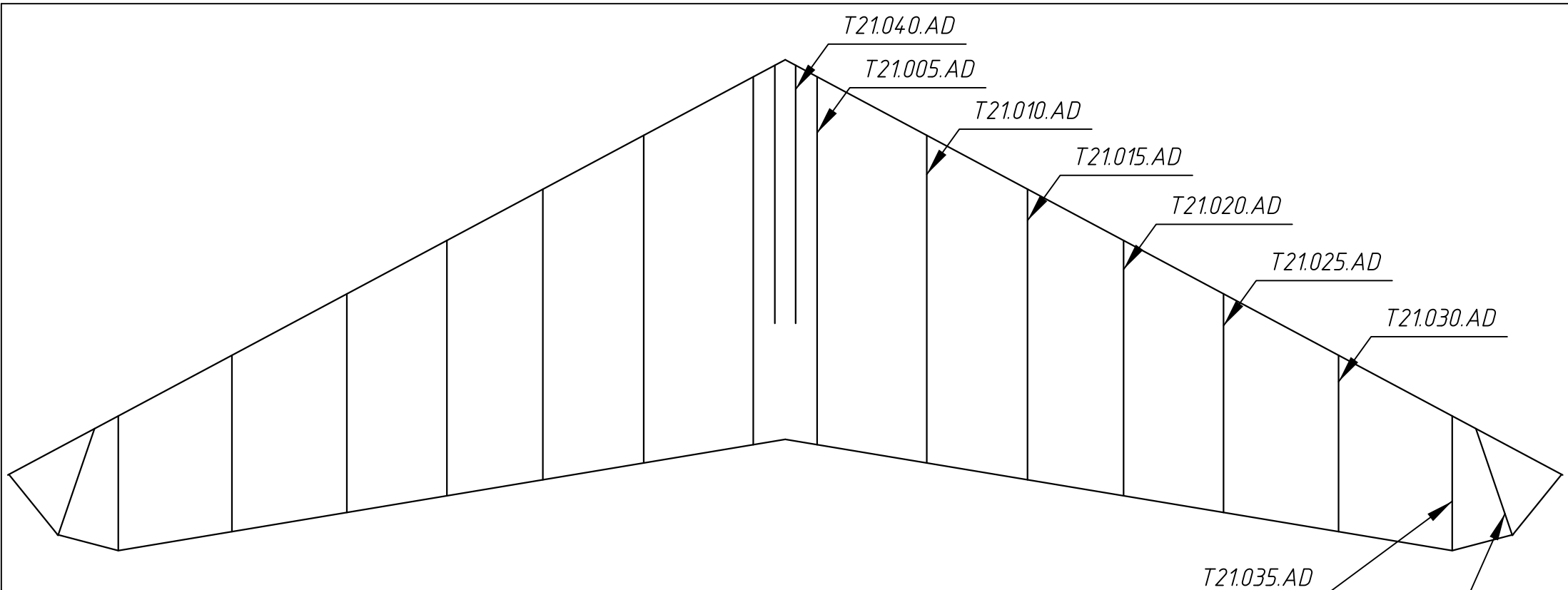
It is important to choose take off direction strictly against the wind. Taking off with side wind will lead the upwind wing of the glider to rise.

Once take off and in 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. Keep the tug on the horizon.

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 were 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



Parts List			
ITEM	QTY	NAME	NOTE
1	2	T21.005.AD	TOP BATTEN N1
2	2	T21.010.AD	TOP BATTEN N2
3	2	T21.015.AD	TOP BATTEN N3
4	2	T21.020.AD	TOP BATTEN N4
5	2	T21.025.AD	TOP BATTEN N5
6	2	T21.030.AD	TOP BATTEN N6
7	2	T21.035.AD	TOP BATTEN N7
8	2	T21.040.AD	KEEL BATTEN
9	2	T21.045.AD	PLUG-ON BATTEN

AEROS			<i>T21.001.AD</i>		<i>Scale:</i>
			<i>BATTENS</i>		

T21.005.AD

Кол. на изделие - 2шт.

Перв. примен.

Справ. №

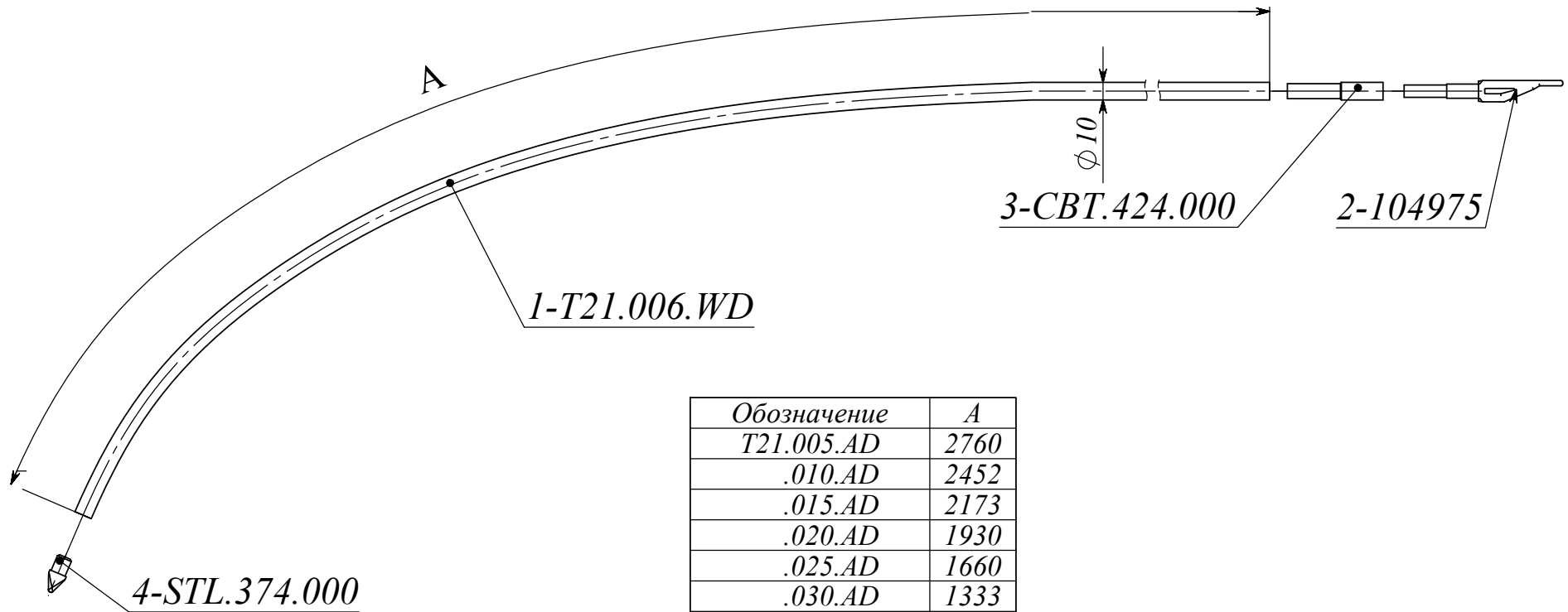
Подпись и дата

Инв. № дубл.

Взам. инв. №

Подпись и дата

Инв. № подл.



Обозначение	A
T21.005.AD	2760
.010.AD	2452
.015.AD	2173
.020.AD	1930
.025.AD	1660
.030.AD	1333
.035.AD	1211

Поз.	Обозначение	Наименование	Материал	Прим.	Кол.
1	T21.006.WD	Трубка	Труба B95 d10x0,75		1
2	104975	Lever batten fitting		Airborn	1
3	CBT424000	Втулка	Труба Д16Т d10x2 OCT 192096-83		1
4	STL374000	Batten Tip (Упор латы)	Полипропилен		1

					T21.005.AD		
Изм.	Лист	№ докум.	Подп.	Дата			
					Top Batten(Лата верхняя)		
Разраб.				03.09.2007			
Пров.							
Т.контр.							
Нач. КБ							
Н.контр.							
Чтв.							
					Лит.	Масса	Масштаб
						0.183	1:2.5
					Лист 1	Листов 1	
					"AEROS"		

T21.100.AD

Кол. на изделие - 1 шт.

Перв. примен.

Справ. №

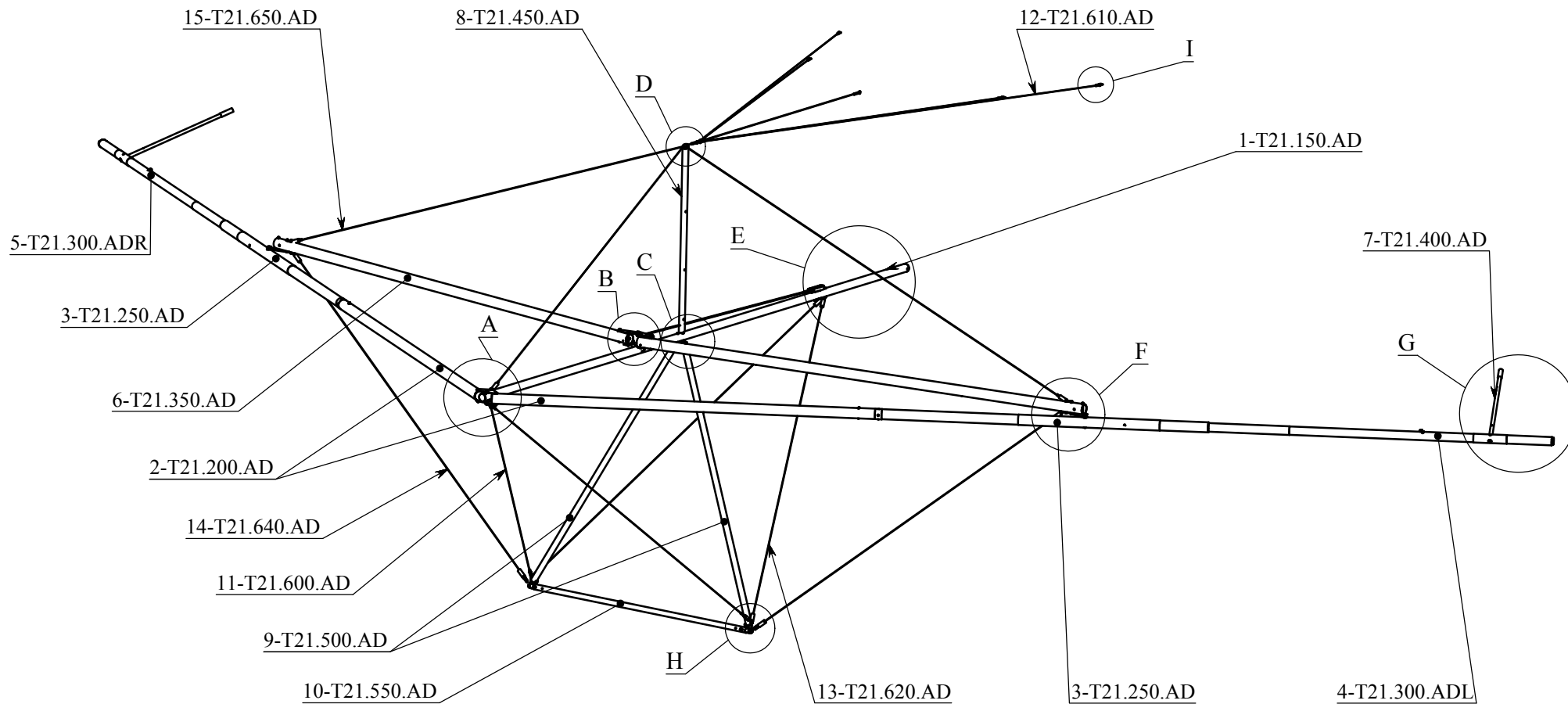
Подпись и дата

Инв. № дубл.

Взам. инв. №

Подпись и дата

Инв. № подл.



					T21.100.AD			
Изм.	Лист	№ докум.	Подп.	Дата	Target 21 Airframe (Тандем)	Лит.	Масса	Масштаб
Разраб.				03.09.2007			0.000	1:20
Пров.								
Т.контр.						Лист 1	Листов 7	
Нач. КБ						"AEROS"		
Н.контр.								
Утв.								

56-Болт 6-78 OCT131120-80

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

40-STL.231.000

56-Болт 6-78 OCT131120-80

34-STL.122.003

72-Washer M6 (DIN 125)

45-STL.521.000

34-STL.122.003

41-STL.232.000

42-STL.235.000

72-Washer M6 (DIN 125)

72-Washer M6 (DIN 125)

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

19-STL.237.000.AD

43-STL.236.007

57-Болт 6-100 OCT131120-80

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

A (1 : 1)

Перв. примен.
Справ. №
Подпись и дата
Инв. № дубл.
Взам. инв. №
Подпись и дата
Инв. № подл.

Изм.	Лист	№ докум.	Подп.	Дата

T21.100.AD

Лист
2

T21.100.AD

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

39-STL.181.000

27-DSC.14A.265.000

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

72-Washer M6 (DIN 125)

72-Washer M6 (DIN 125)

25-DSC.14A.261.000

16-T21.660.AD

35-STL.122.013

42-STL.235.000

73-Washer M8 (DIN 125)

26-DSC.14A.262.000

66-Nut M8 OCT 133042-80

35-STL.122.013

71-Tapping Screw 4.2-16

69-Splint 2.0 x 20 SBS2020

18-DSC.14A.263.000.AD

17-T21.670.AD

60-Болт 6-79 OCT131155-80

61-Болт 6-86 OCT131155-80

B (1 : 1)

Изм.	Лист	№ докум.	Подп.	Дата

T21.100.AD

Лист

3

Перв. примен.

Справ. №

Подпись и дата

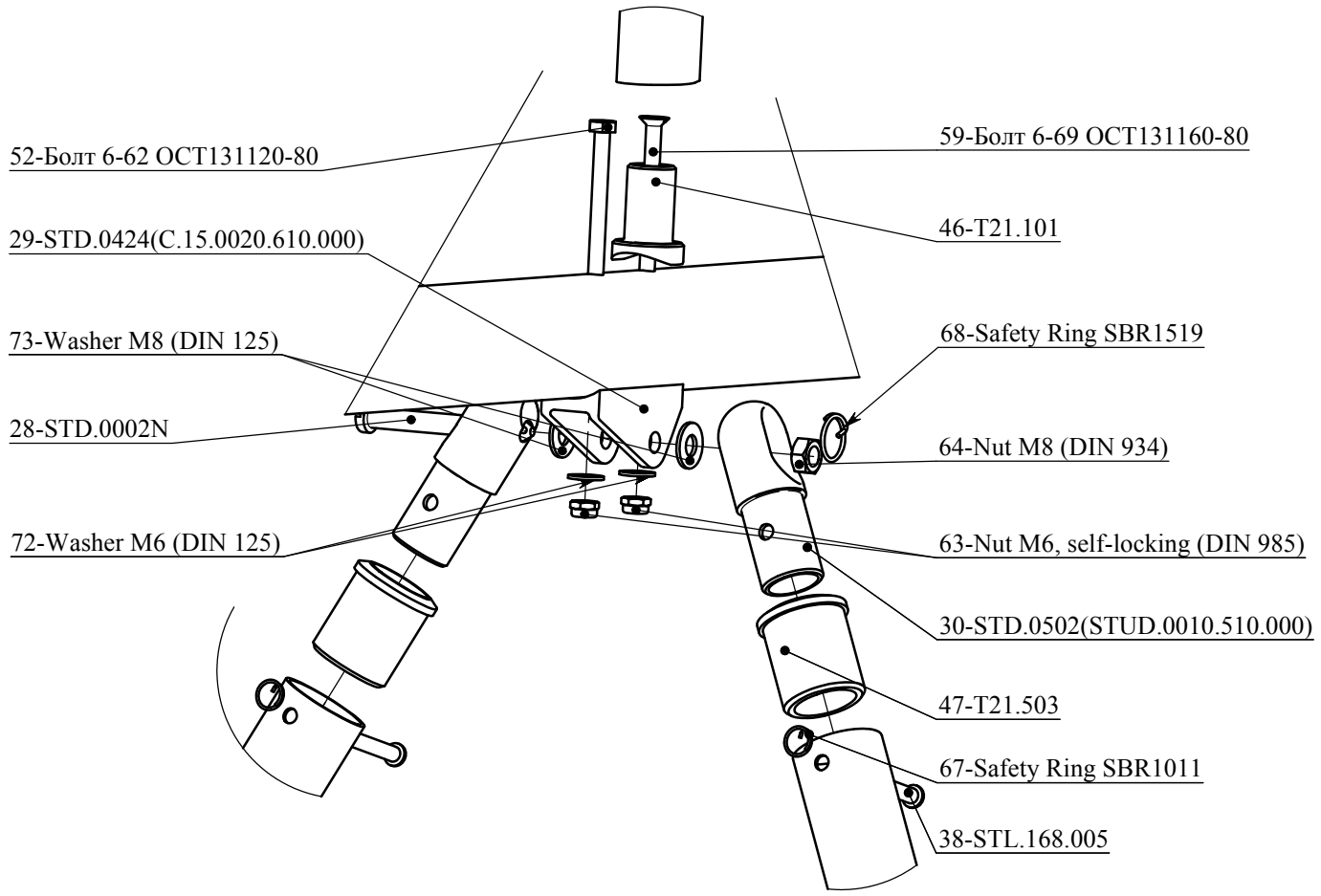
Инв. № дубл.

Взам. инв. №

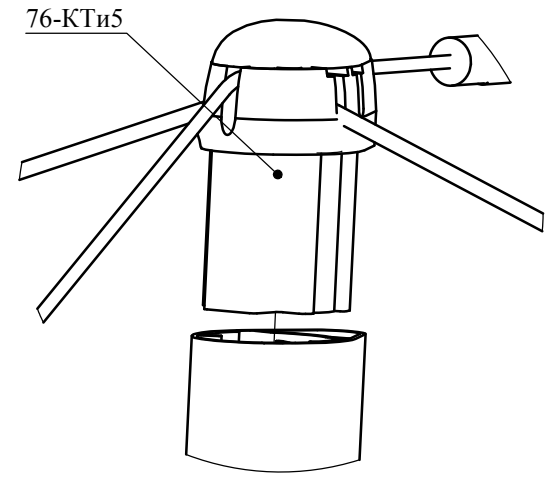
Подпись и дата

Инв. № подл.

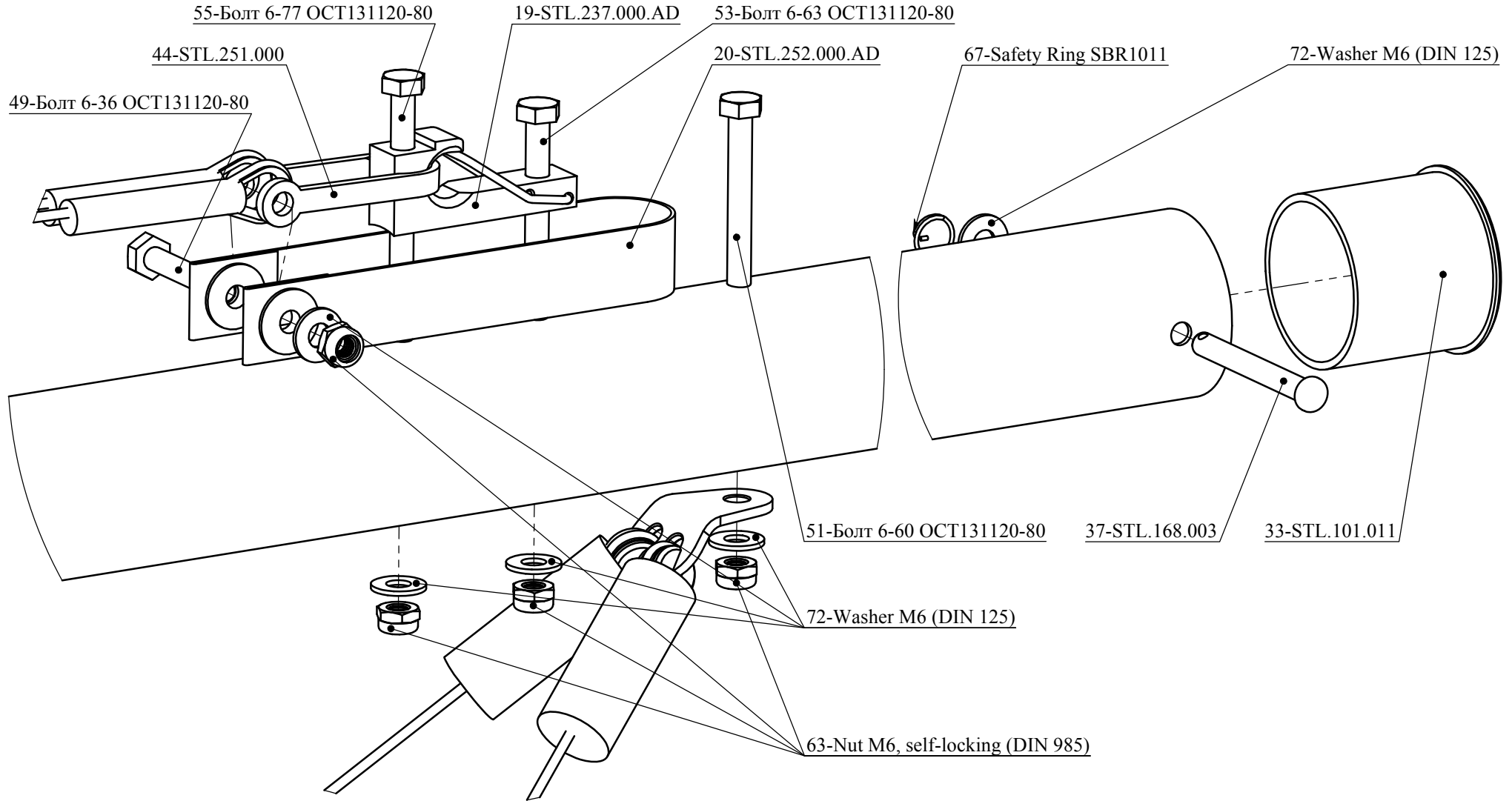
C (1 : 2)



D (1 : 1)



Изм.	Лист	№ докум.	Подп.	Дата



E (1 : 1)

Изм.	Лист	№ докум.	Подп.	Дата

T21.100.AD

Лист
5

T21.100.AD

Перв. примен.

Справ. №

Подпись и дата

Инв. № дубл.

Взам. инв. №

Подпись и дата

Инв. № подл.

65-Nut M8, self-locking (DIN 985)

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

72-Washer M6 (DIN 125)

69-Splint 2.0 x 20 SBS2020

66-Nut M8 OCT 133042-80

73-Washer M8 (DIN 125)

69-Splint 2.0 x 20 SBS2020

72-Washer M6 (DIN 125)

B

69-Splint 2.0 x 20 SBS2020

58-Болт 8-76 OCT131120-80

72-Washer M6 (DIN 125)

24-DSC.14A.113.000

54-Болт 6-76 OCT131120-80

25-DSC.14A.261.000

39-STL.181.000

23-CBTL.13.114.000

35-STL.122.013

32-STG.B.308.000

F (1 : 2)

Изм.	Лист	№ докум.	Подп.	Дата

T21.100.AD

Лист

6

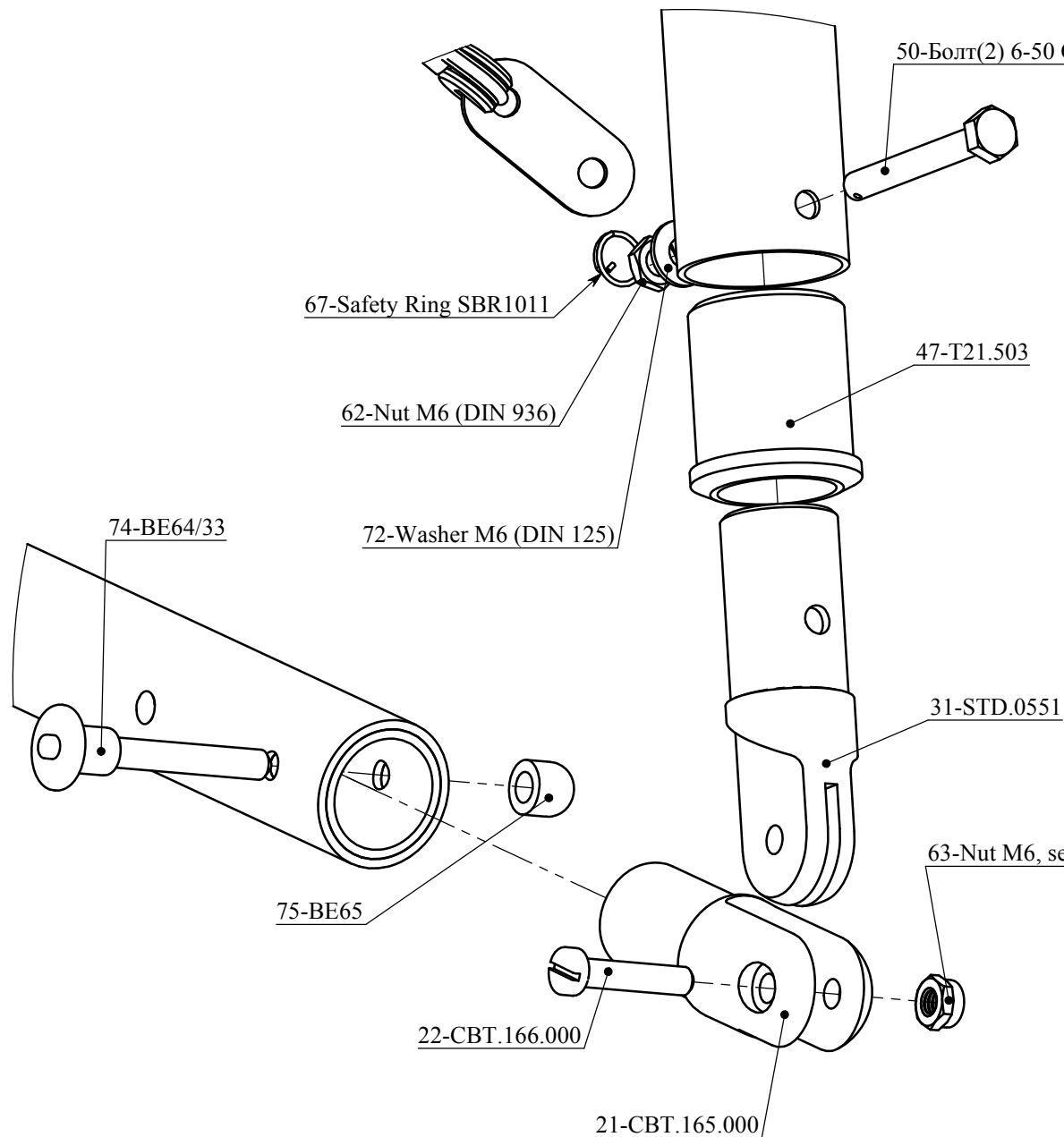
T21.100.AD

Копировал

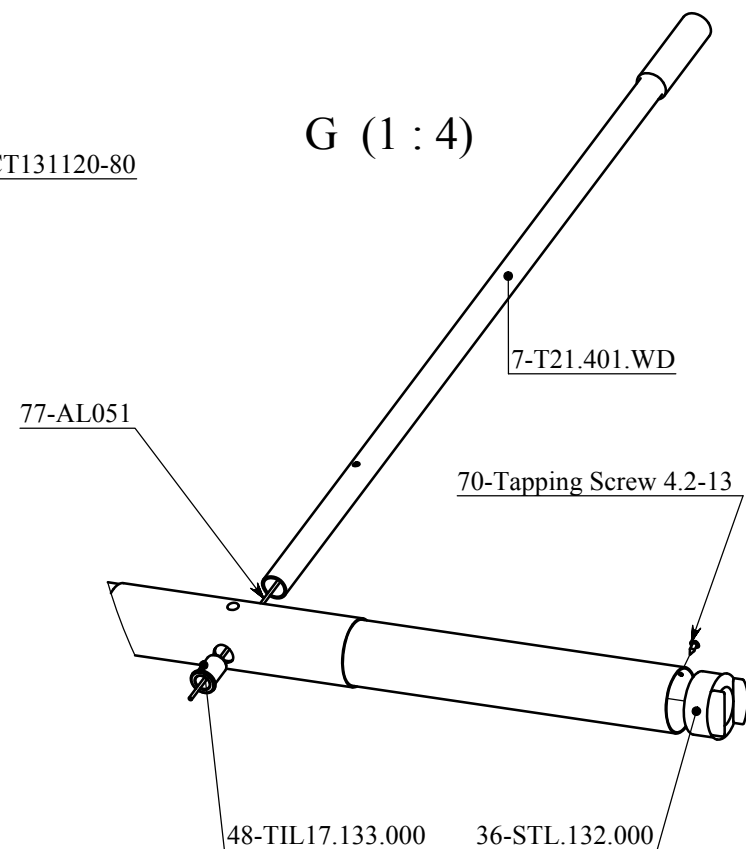
Формат А3

T21.100.AD

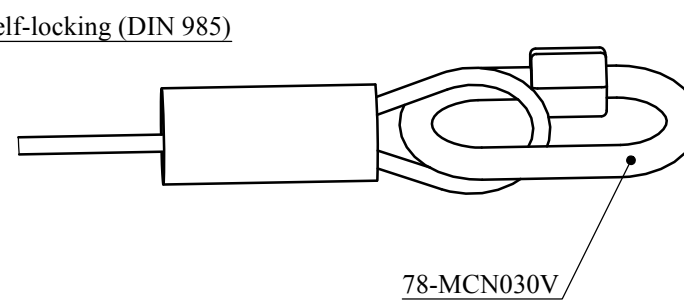
H (1 : 1)



G (1 : 4)



I (2 : 1)



Изм.	Лист	№ докум.	Подп.	Дата

T21.100.AD

Копировал

T21.100.AD

Лист

7

Формат А3