NOVAERY

ROCKET SCIENCE FOR ARCHERY

Recurve Mittelteil 1st Edition

Manual

Introduction

Congratulations on the purchase of your new NOVAERY recurve riser. You now own a genuine piece of German engineering. Our risers are manufactured to the highest quality standards. Our design and development process follows the European Cooperation for Space Standardization (ECSS). This means that every component has been designed with the same care and safety as aerospace components.

Every single component is manufactured in Germany. This allows us to guarantee the highest quality of the manufacturing process and reduces the CO2 footprint as well as the environmental impact. This way you actively contribute to a more sustainable production of archery equipment.

Archery is a wonderful sport for people of all ages and abilities. It is important to note that improper use of archery equipment can lead to dangerous situations that can result in serious or even fatal injury to the archer or others. It is your responsibility to use your equipment responsibly to protect yourself and other athletes while performing our sport.

READ THE MANUAL CAREFULLY AND COMPLETELY BEFORE USING YOUR BOW. It can be downloaded for free at any time from our website www.novaery.de.

We wish you lots of fun with your new equipment and all the best!

Table of Contents

1 Technical Specifications

	AESTUS			VEGA		
Length	25“			25“		
Limbs	Short	Medium	Long	Short	Medium	Long
Length Bow	66“	68“	70“	66“	68“	70“
Mass	1250g			1300g		
Material	EN AW 7075 Aluminum			EN AW 7075 Aluminum		
Limb compatibility	X-Series (Formula compatible)			ILF-Series		

Table 1: Technical specifications

2 Terminology

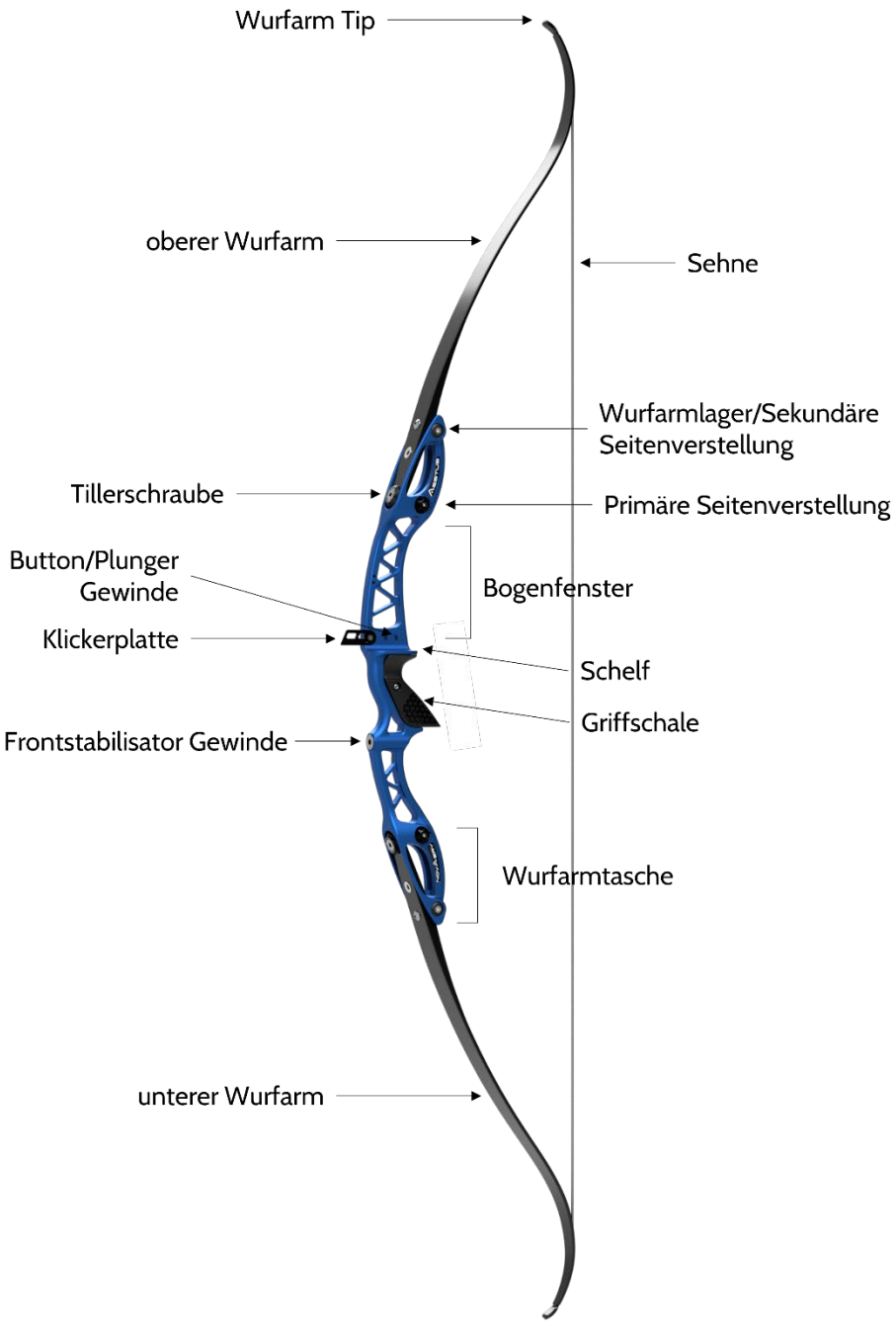


Figure 1: Terminology

3 Precautionary Measures and Safety Instructions

This manual contains various safety warnings and notices marked WARNING, CAUTION or NOTICE. These signal words are intended to draw attention to important safety information. WARNING indicates a hazardous situation which, if not avoided, could result in serious injury or even death. CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury. NOTICE refers to safe handling of the material that does not involve personal injury.

WARNING
Read this manual carefully before using your NOVAERY riser. Follow all safety instructions given. You are responsible for the safe handling of your equipment.

WARNING: Always read the warnings and manufacturer's instructions for all products used in conjunction with a NOVAERY bow, including all accessories and components attached directly to or used in conjunction with the bow, such as targets, arrows, release aids, etc.

WARNING: The bow may only be shot if it is set within the specified parameter range and is functioning properly (see section 3). If you are unsure about the bow setting, contact NOVAERY support at info@novaery.de.

WARNING: Before shooting your bow, carefully check that the bow, accessories, arrows and finger tab are in good condition. Any possible damage to your bow should be investigated by NOVAERY to allow for repair or replacement.

WARNING: Before shooting your bow or other archery products, NOVAERY recommends that you receive training and instruction from a certified archery coach in the proper use of the equipment. Contact an archery club or the archery association in your region or country.

WARNING: Children and young people must always be supervised by an adult when shooting or adjusting the bow.

WARNING: Never consume alcohol or other drugs while adjusting or shooting your bow.

WARNING: Always wear safety glasses when adjusting or shooting your bow.

WARNING: Always use a bow bowstringer to string and unstring the bow (see 6.2).

WARNING: Never release the bow while you are stringing, at full draw or shooting. It is essential that your hand is firmly seated in the grip and does not slip. The use of hand lotions, sunscreens and insect repellents can affect the tight fit in the grip.

WARNING: Always ensure that the area around your bow is clear of any obstacles so that no objects can become caught in the moving parts of the bow. When shooting your bow, never wear loose clothing, jewelry or other items worn on your body that could get caught in the bow or bowstring when shooting.

WARNING: Never point your bow at another person. Watch your target and the area behind it. Never shoot arrows directly into the sky. Make sure the path from your shooting position to the target and beyond is free of people, animals and obstacles. The field of view through the sight may not clearly show the trajectory of the arrow, which is altered by environmental influences such as wind. The arrow may therefore also hit obstacles outside the straight line connecting the bow and the target.

WARNING: Never shoot your bow dry. Dry shooting means shooting the bow without an arrow. Never attempt to draw a bow that is too heavy for your strength or that does not match your draw length, as this may result in an unintentional dry shot. A dry shot could cause the bow to break and you or

others to be fatally or seriously injured. If your bow has been dry-shot, both visible and non-visible damage may occur. In this case, the bow must be sent to NOVAERY for inspection before further use.

WARNING: Do not perform maintenance or adjustments or any other work on your bow while you are drawing the bow or at any other point in the shooting cycle. Do not allow anyone to work on or touch your bow during the shooting cycle.

WARNING: Never shoot an arrow with the wrong arrow stiffness (spine) or the wrong arrow length. Shooting with the wrong arrow stiffness or length can cause the arrow to break and seriously injure you or others. Refer to the arrow manufacturer's arrow selection chart to select the correct arrow size and length for your setup.

WARNING: Never shoot a damaged arrow. Check your arrows for damage before each shot. Follow the arrow manufacturer's warnings and instructions for proper arrow inspection. Dispose of all damaged arrows.

WARNING: Never modify your bow mechanically. Drilling holes, cutting, filing or grinding are examples of mechanical modifications to your bow that are likely to break the bow and cause serious or fatal injury.

WARNING: Never draw or shoot a bow with a frayed, worn or damaged string as it may break. Frayed, worn or damaged bowstrings should be replaced immediately before the bow is used. Check the string carefully each time before shooting your bow. NOVAERY recommends replacing the string after 10,000 shots or after six months at the latest, whichever comes first.

WARNING: Never draw or shoot your bow unless all string accessories (kisser, nocking points, string dampeners) are properly installed and attached to the string.

WARNING: Never work on the string with sharp objects such as knives or direct heat sources such as open flames, as these can easily cut or tear the string.

WARNING: Only use original NOVAERY spare parts. Replacement of damaged parts must only be carried out by NOVAERY.

WARNING: Never expose your bow to direct sunlight, extreme heat or prolonged high humidity. UV rays, heat, humidity and improper storage can damage your bow.

WARNING: When handling and using a bow, including all stages of drawing the bow, releasing the string and lowering the bow, the archer and all bystanders must keep all body parts out of the path of the bowstring and away from all moving parts.

4 Product Description

4.1 Scope of Delivery

The components in Table 2 are included in the scope of delivery of the center section. The components installed on the center section are not listed. Check the completeness of your equipment immediately after opening the packaging.

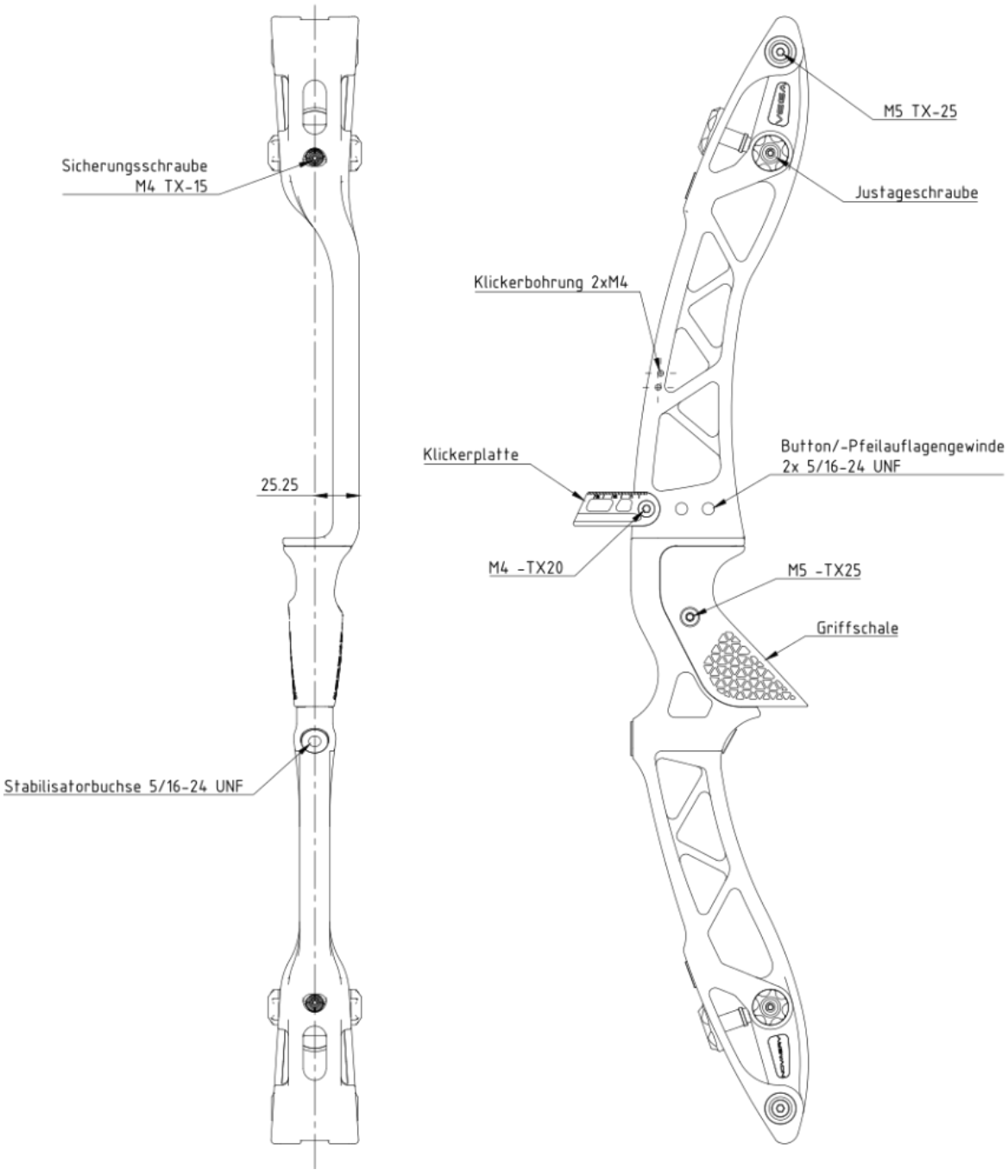
Pos.	Qty.	Name	Notice
1	1	Riser	
2	1	fabric bag	
3	2	F.L.A.T.-Tools	
4	2	0,5 mm shims	
5	8	0,1 mm shims	
6	1	plastic pack	storage for small parts
7	1	Wiha Pocketstar TORX	
8	1	TX-25 key	
9	1	TX-8 key	
10	1	paper calibration strip	
11	2	M5x16 TX countersunk screw	sight screws
12	2	M5x12 TX countersunk screw	sight screws (screwed in)
13	2	M5x10 TX countersunk screw	sight screws
14	1	M4x8 TX button-head screw	clicker screw (screwed in)

Table 2: Scope of delivery

Figure 2: scope of delivery

4.2 Overview

In Figure 3 the basic geometry of the NOVAERY recurve riser with the relevant threads and TORX sizes are shown.



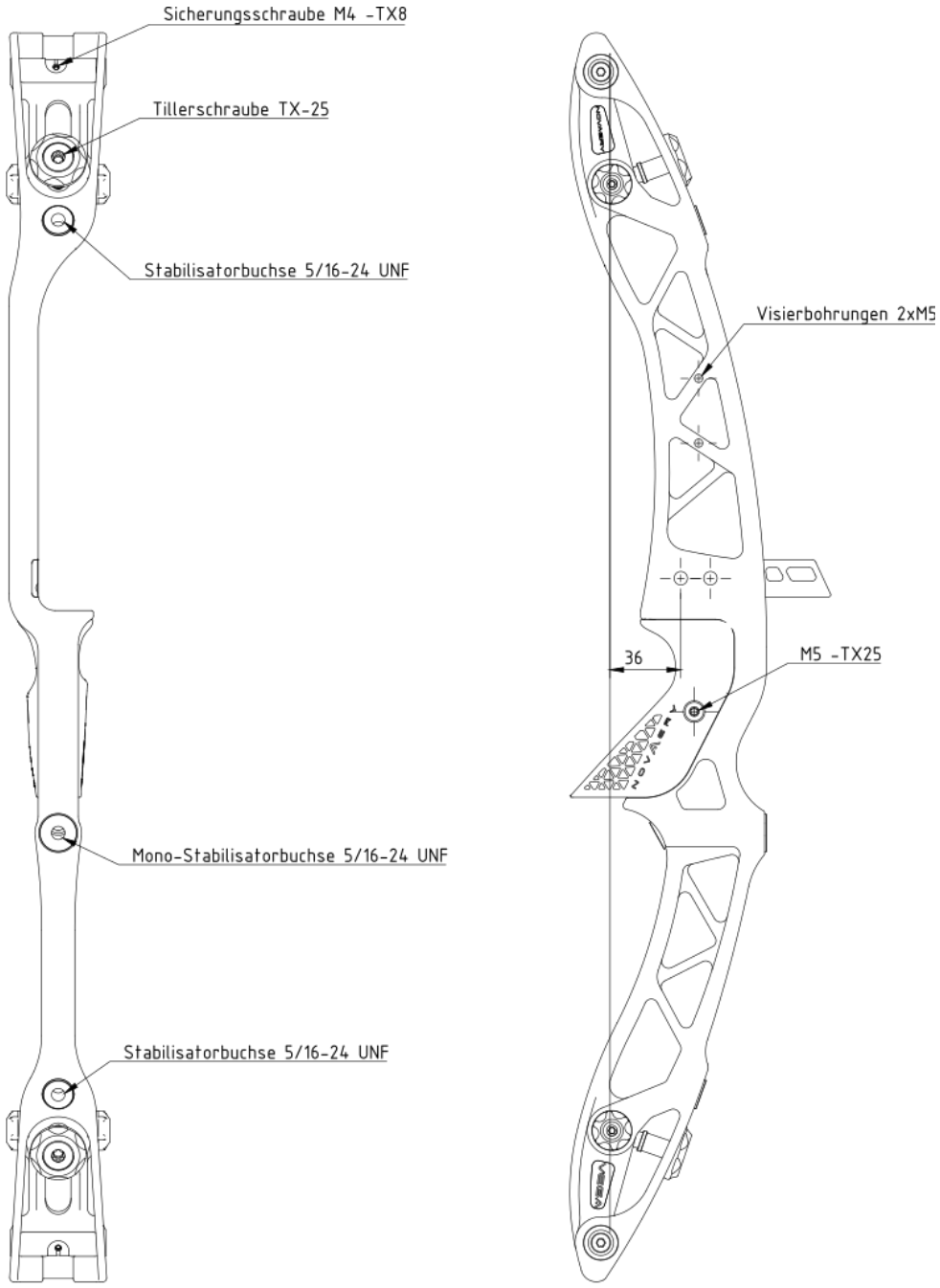


Figure 3: Basic geometry, thread and TORX spanner sizes

4.3 Form Locking Alignment Technology - F.L.A.T.

The high-end riser AESTUS and VEGA are equipped with the Form Locking Alignment Technology. The great advantages of this system are:

1. the form-locking connection between the limb and the riser components

2. the form-locking force transmission into the riser

3. the dual lateral alignment

NOTICE: For the limb to work optimally, special care must be taken when adjusting it due to the increased adjustment possibilities.

The limbs are laterally aligned by two different mechanisms. These are shown in Figure 4.

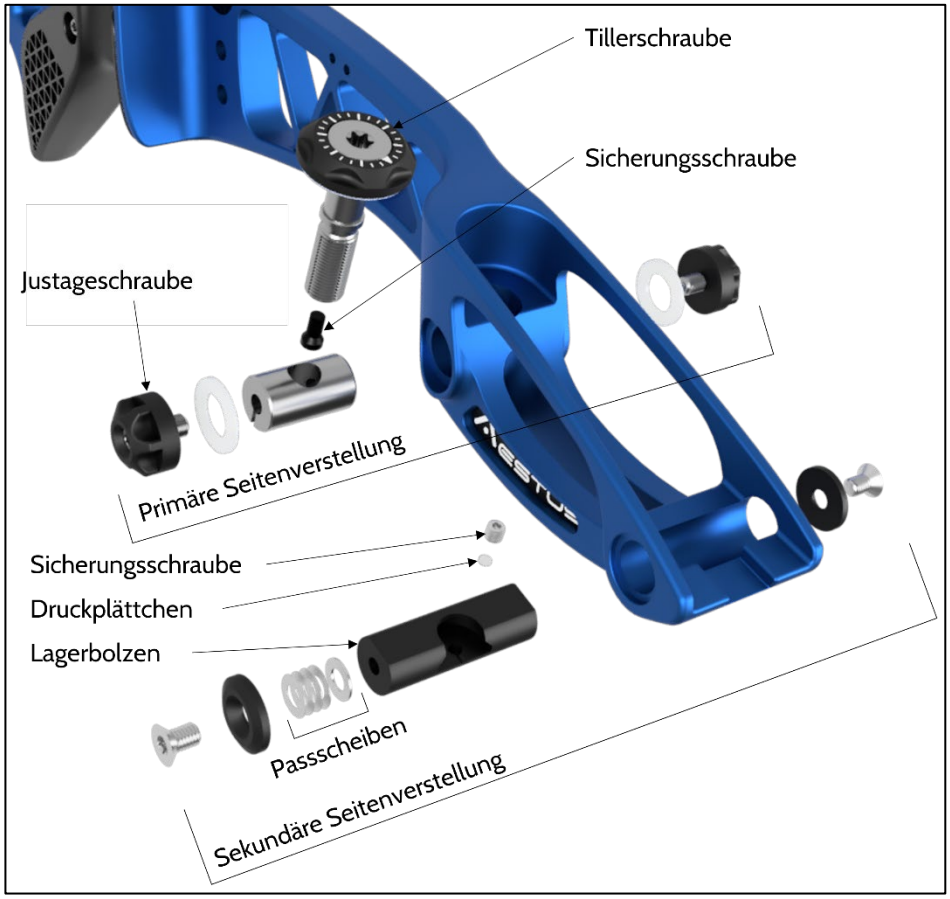


Figure 4: Primary and secondary lateral alignment mechanism

5 Safety-Relevant Parameters

WARNING: The Tiller bolts may only be unscrewed a maximum number of turns starting from the lower stop to guarantee structural integrity. Depending on the thickness of the limb, the lower stop is only reached when no limb is mounted. So, test the lower stop without the limb.

Riser	AESTUS 1st Edition	VEGA 1st Edition
Maximum tiller screw turns	9	11

Table 3: Maximum permissible tiller screw turns

WARNING: The bow may only be shot if the tiller screws are properly secured. This is the only way to ensure that the vibrations during shooting do not loosen the capstan screws.

To secure the tiller screw, the rear locking screw must be tightened firmly with a TX-15 key, while the tiller screw on the front is held in position with a TX-40 (AESTUS) or TX-25 (VEGA). The locking screw spreads the thread of the tiller screw and presses the thread flanks against each other. In this way, the rotation of the tiller screw is secured by friction. In addition, the tiller screw is positioned exactly centrically.

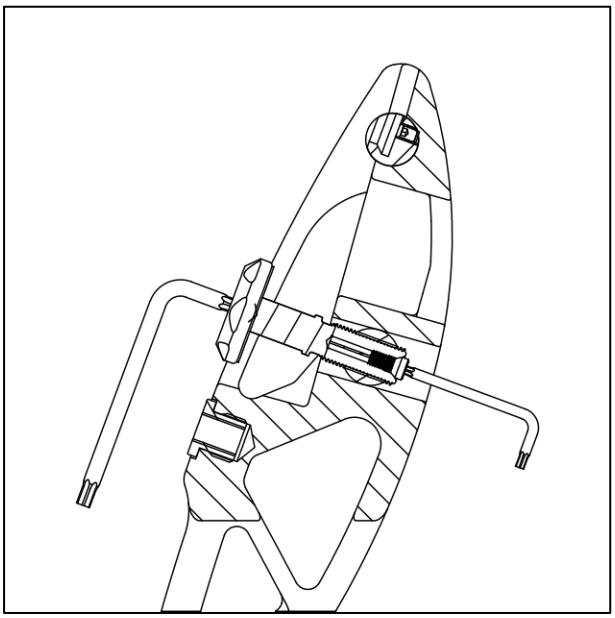


Figure 5: Tiller screw securing

WARNING: NOVAERY risers are designed for a continuous load of up to a maximum of 55 lbs plus an appropriate safety factor according to ECSS. The bow must never be shot with a draw weight higher than 55 lbs.

6 Assembly and Installation

6.1 Mounting the Limbs

Carefully align the dovetail bushing of the limb with the corresponding groove in the limb pocket. Slide the limb into the pocket and gently press down on the limb to engage the locking button. When the locking button clicks into place, you will hear a click and the limb will be firmly seated in the pocket. Make sure to install the upper and lower limb in the correct position.

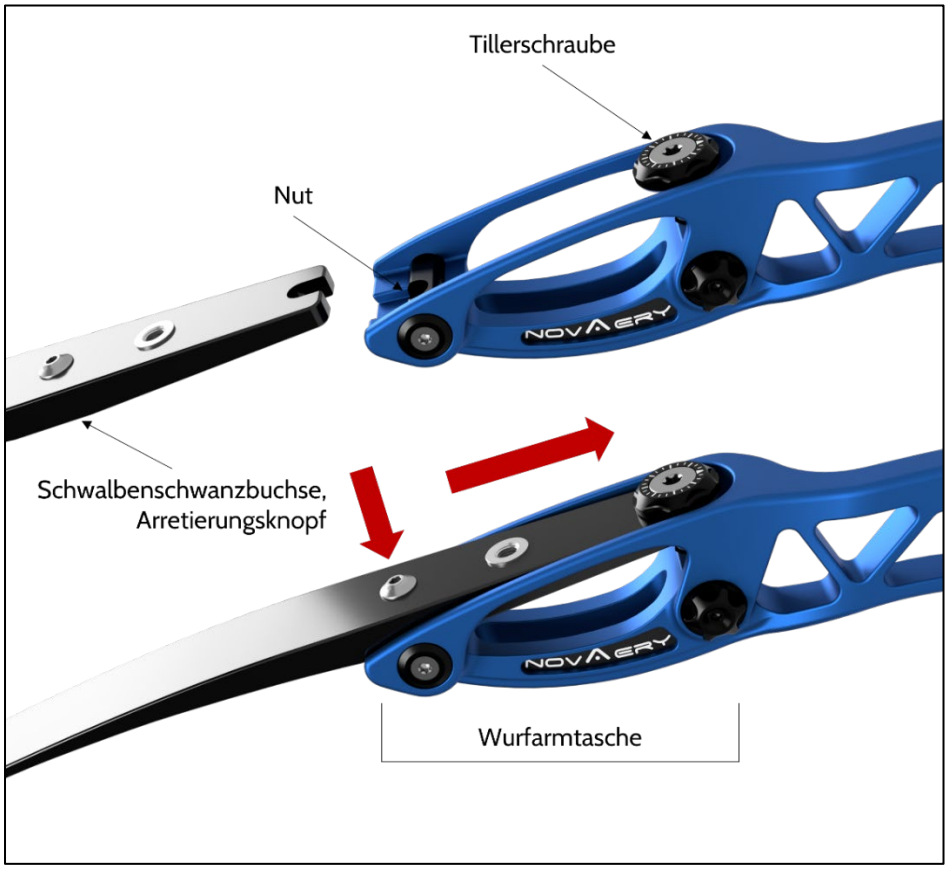


Figure 6: Mounting the limbs

6.2 Mounting the String and Stringing the Bow

WARNING: Always use a bowstringer to string and unstring the bow.

1. First check the material. The length of the string must match the length of the bow. The string must not have any damage or knots. Also check the correct fit of the limbs in the riser.
2. Slide the upper, usually larger, loop of the string over the upper limb.
3. Place the lower loop in the notches of the tip on the lower limb, making sure that the string is centered on the lower limb in the groove.
4. Place the tensioning string on the limbs. In the case of the upper limb, the string must be passed through the loop of the bowstringer.
5. Place one foot in the bowstringer and pull the riser upwards by the grip, making sure that the bowstringer does not slip on the limbs.
6. Now the string on the upper limb can be pushed into the notches of the tip.
7. Release the riser carefully until there is tension on the string.
8. Take the bowstringer off the bow.

The unstringing of the bow is done in exactly the opposite order.

6.3 Adjustment and Tuning

Take the necessary time to adjust and tune your bow. A bow cannot be set up correctly in a hurry. Also note that brand new material usually has to settle first. This means that when you start shooting with it, there are still small changes that can influence the tuning. For example, a new string will elongate and the varnish on the limbs will start to show signs of pressure at the contact points. Therefore, first setup your bow with basic parameters. Then shoot a few hundred arrows and check the setting, e.g. the alignment of the limbs. Then you can start with the final tuning.

6.3.1 Recommended Brace Height

The correct brace height is measured between the string and the center of the button. This value is always reproducible and independent of the grip used.

AESTUS und VEGA 25“			
Limb	Short	Medium	Long
Nominal length of the bow	66“	68“	70“
Recommended brace height	21,0-22,5 cm	21,5-23,0 cm	22,0-24,5 cm

Table 4: Recommended stand height

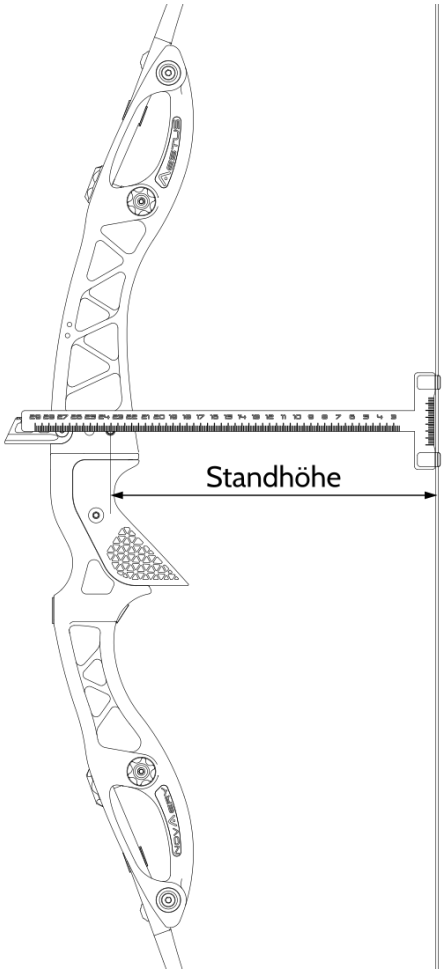


Figure 7: Brace height

6.3.2 Draw Weight and Tiller

The draw weight can be set and the tiller adjusted via the tiller screws.

a. Tiller: The tiller is adjusted to compensate for the offset between the geometric center of the bow and the arrow rest. This is to accelerate the arrow horizontally without pitching. The tiller

$$tiller = t_{top} - t_{bottom}$$

is defined as the difference between the distance between the string and the limb above the riser t_{top} and below the riser t_{bottom}. The value to be set depends on the shooting technique, the stabilizer configuration and the limbs used. We recommend a value between 0 mm and 5 mm.

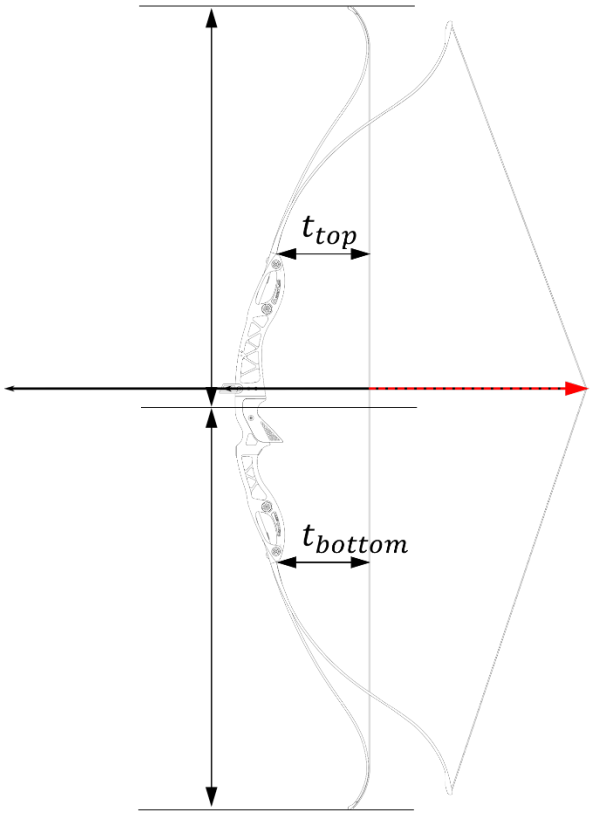


Figure 8: Tiller

b. Draw weight: If both tiller screws are turned synchronously, the tiller remains constant and the draw weight can be changed.

NOTICE: The Tiller screws must only be turned in the unstringed state, otherwise the PTFE washer under the screw head may deform.

If the position of the tiller screws is to be changed, the following steps must be followed. This ensures that both the bearing surface of the bearing bolt and the head of the Tiller screw lie flat on the limb. The steps are shown in figure 9.

1. The bow must be unstringed and the limbs must be removed.
2. Then loosen the locking screw of the tiller screw. The tiller screw itself should be held in position with the appropriate TORX key.

3. Now loosen the small locking screw of the bearing bolt.

NOTICE: Loosen the screw by no more than one turn.

4. Now the limb is put back in the pocket.
5. Loosen the side screw of the bearing bolt opposite the bow window, i.e. the side without shims, by half a turn. The bearing bolt can now rotate freely. This does not permanently change the lateral limb alignment.
6. Now turn the tiller screw to the desired position. The F.L.A.T. tool can be used as an indicator for fine adjustment.

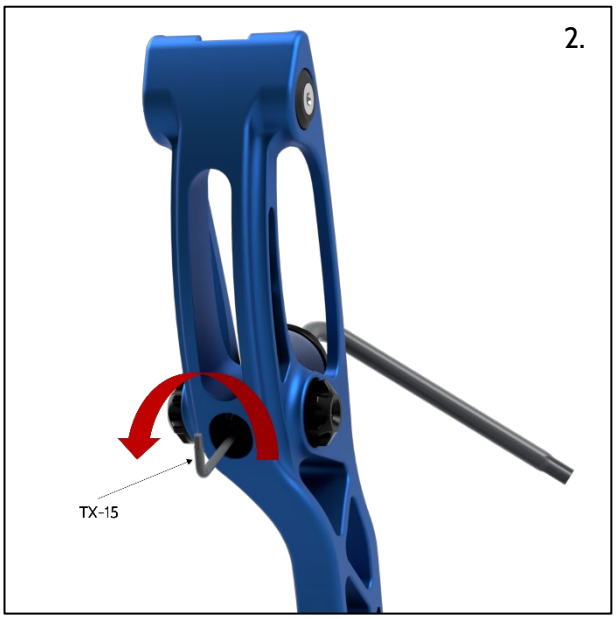
WARNING: The Tiller bolts may only be unscrewed a maximum number of revolutions starting from the lower stop to guarantee structural integrity. Depending on the thickness of the limb, the lower stop is only reached when no limb is mounted. So, test the lower stop without the limb.

riser	AESTUS 1st Edition	VEGA 1st Edition
Maximum tiller screw turns	9	11

Table 5: Maximum permissible tiller screw turns

7. Stringing the bow according to section 6.2. The tiller screw and the bearing bolt usually automatically find the correct position due to the tensioning force. Nevertheless, check that both components are correctly seated.
8. Once the correct position of the tiller screw has been set, tighten the side screw of the bearing bolt again. The bolt must be locked on the opposite side to secure the position when tightening.
9. Now tighten the locking screw in the tiller screw. This spreads the Tiller screw and locks the rotation.
10. Now detach the limb and tighten the locking screw of the bearing bolt very lightly.

NOTICE: The locking screw of the bearing bolt must only be tightened very lightly. The desired clamping effect already occurs at a very low torque.



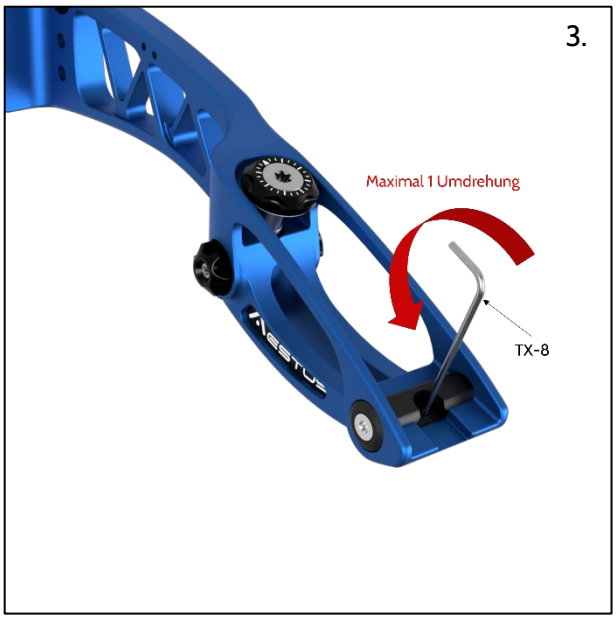


Figure 9: Adjusting the Tiller Screw

6.3.3 Lateral Limb Alignment

With the help of the Form Locking Lateral Alignment Technology (F.L.A.T.) the limbs can be precisely aligned so that the arrow is accelerated laterally, exactly in a straight line. The aim is to align the limbs centrally over the limbs and in line with the stabilizer. It should be noted that the contact surface of the stabilizer is made rectangular to the longitudinal axis of the stabilizer. To test this, simply mount another stabilizer. If the picture is the same, a straight stabilizer can be assumed. For the average alignment of the string over the limbs, limb gauges can be used which are equipped with tolerance strips.

When aligning the limbs, the following procedure should be followed due to the higher complexity caused by the double lateral adjustment of the F.L.A.T.:

1. First, the secondary lateral adjustment is used to compensate for any tolerances in the dovetail bushing of the limb. Basically, the secondary lateral adjustment should be adjusted once for tolerance compensation, while the actual limb alignment is then done via the primary lateral adjustment. The secondary lateral adjustment only needs to be adjusted when new limbs are used. At the factory, the secondary lateral adjustment is centered on the 0-position in the limb pocket. The 0-position is reached when one 0.5 mm disc and four 0.1 mm shims are inserted, i.e. the bolt has a total distance of 0.9 mm to the side.
   1.1. The limbs must be mounted and the bow strung (see 6.1, 6.2).
   1.2. With the help of the supplied paper calibration strip, the distance between the bars of the limb pocket and the outer edges of the limb can be set exactly in the center. To do this, the calibration strip must be folded in a zigzag along the printed lines.

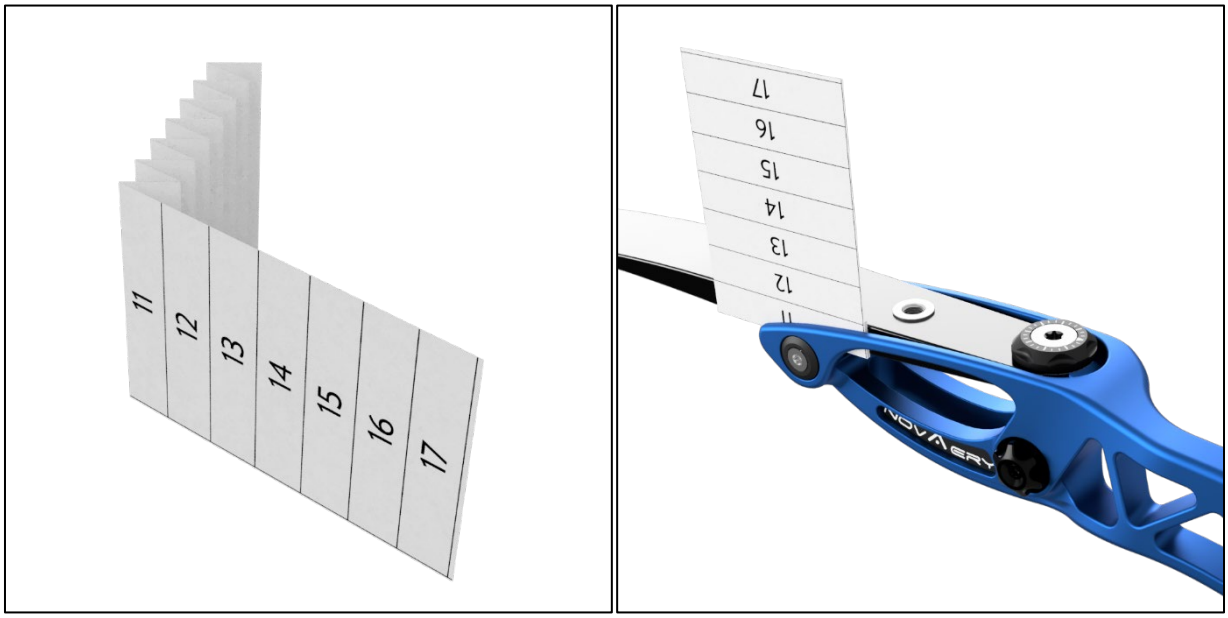


Figure 10: Paper calibration strips

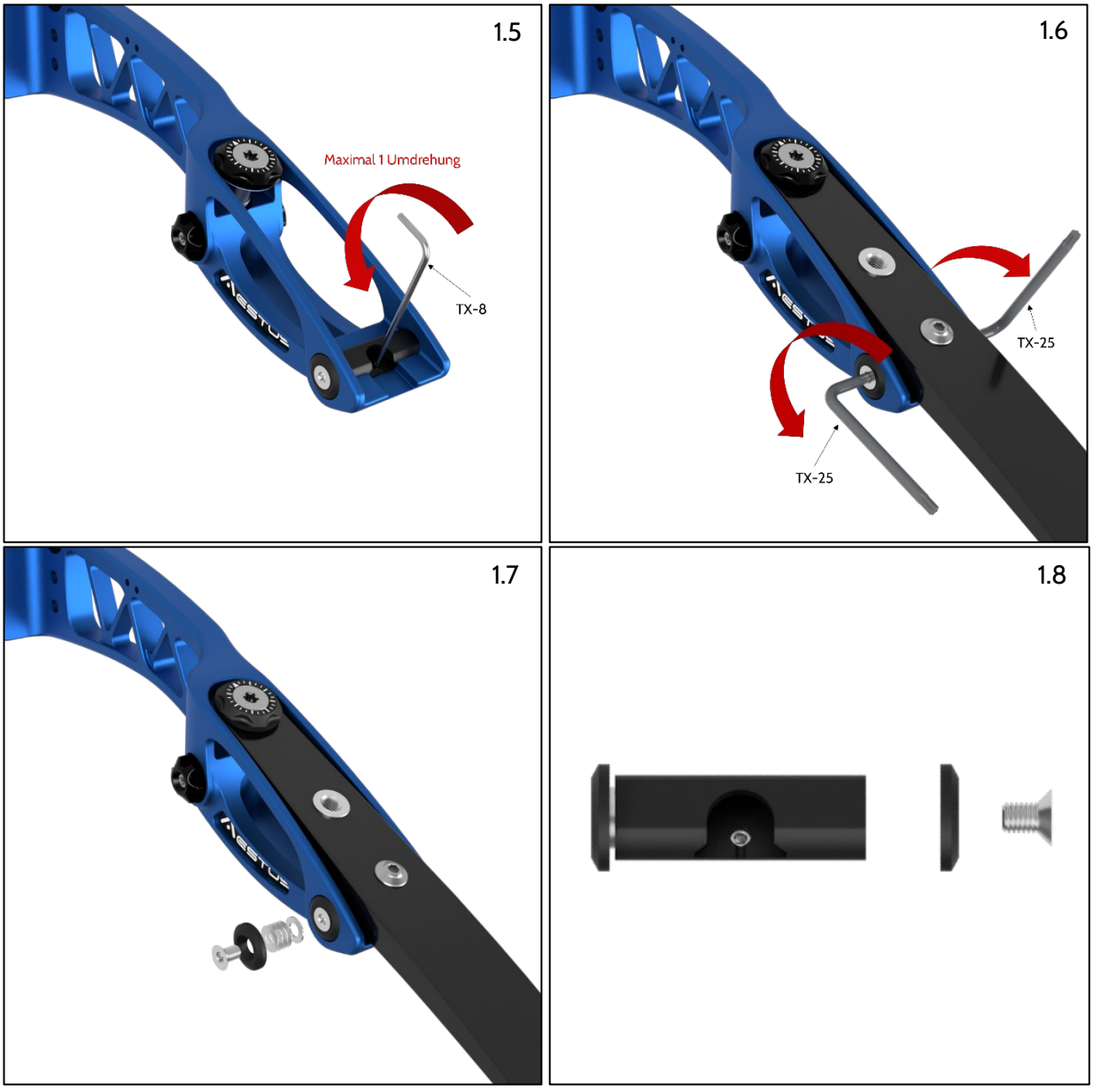
   1.3. Now check how many layers of the strip fit into the gap to the right and left of the limb at the level of the bearing bolt. The printed numbering can be used as an aid.

NOTICE: If the gap is so large that all 20 layers fit between them, find a tool that fits in the gap and place it in the gap in addition to the calibration strip. E.g. the F.L.A.T. key supplied or a checker. Use the same tool for both sides so that the thickness is identical.

   1.4. the calibration strip is approx. 0.1 mm thick per layer. If the difference is greater than one layer, the secondary lateral adjustment can be adjusted.
   1.5. The secondary lateral adjustment can also be adjusted in the tensioned state. To do this, however, the locking screw in the bearing bolt must first be loosened by a maximum of one turn.

1.6. Now the side screws of the bearing bolt can be loosened. The shims are always on the side of the bow window. This screw must be unscrewed completely. The opposite screw must only be loosened by a few turns.
1.7. Adjust the number of washers on the screw according to the measured deviation. The thin shims have a thickness of 0.1 mm, while the thicker ones are 0.5 mm thick.
1.8. Screw the screw with the shims back into the bearing bolt and tighten it. Make sure that the shims are pressed against the bearing bolt. If necessary, loosen the screw on the opposite further.
1.9. Tighten the screw on the opposite side and counter the system with it.
1.10. Check the position of the limb again with the paper calibration strip.
1.11. When the limb is in the middle of the limb pocket, unstring the bow and detach the limb. Now tighten the locking screw of the bearing bolt very slightly.

NOTICE: The locking screw of the bearing bolt must only be tightened very lightly. The desired clamping effect already occurs at a very low torque.



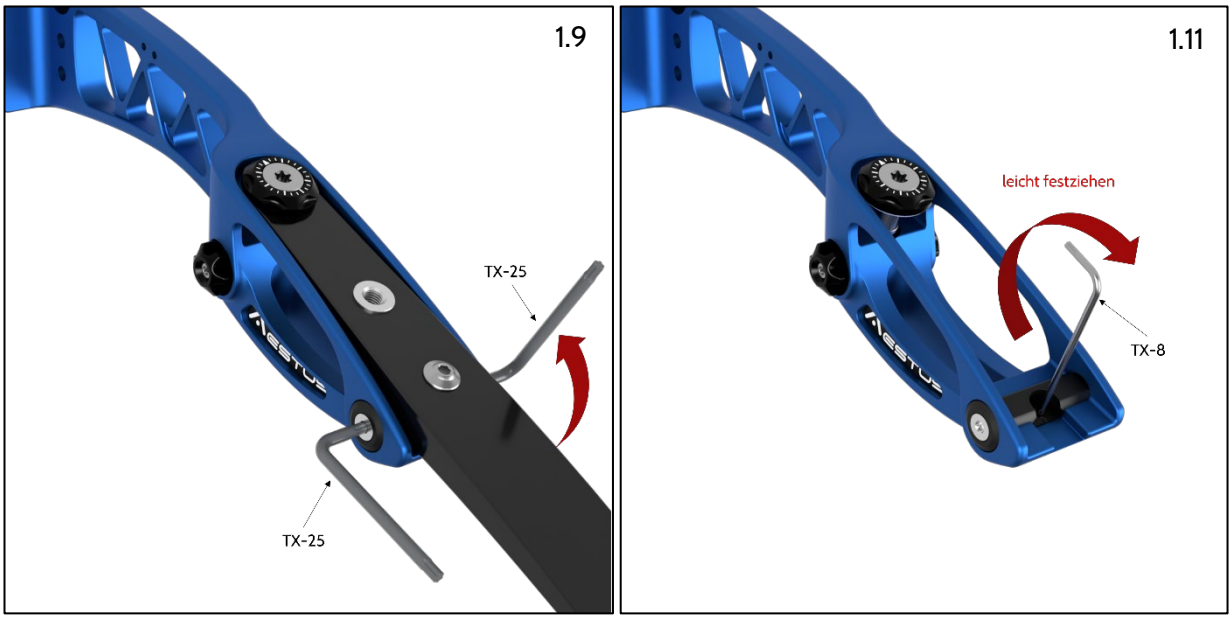


Figure 11: Adjusting the secondary lateral adjustment

2. Then you can start aligning the limbs using the primary lateral adjustment.
   2.1. Mount the limbs and stringing the bow according to section (see 6.1, 6.2).
   2.2. Position the bow so that you have a good view of the bow from behind and the limbs are free in the air. E.g. in a mounting bracket or on a chair.
   2.3. Place at least two limb gauges close to the riser on the limbs.
   2.4. Now you can visually check the position of the string over the bow. Do not only pay attention to the limb gauges. The position of the stabilizer is also an indicator of correct alignment.

NOTICE: Use a camera on a tripod for the adjustment process instead of just watching over the string with your eyes. This will give you a clearly defined image without any possible errors due to head movement.

   2.5. Change the setting according to the following instructions. The F.L.A.T. tool is used according to Figure 13.

CAUTION: Only use the F.L.A.T. tool to adjust the primary lateral adjustment and never the exposed hexagon socket. This is only used for factory assembly. Using it when adjusting the bow may cause damage.

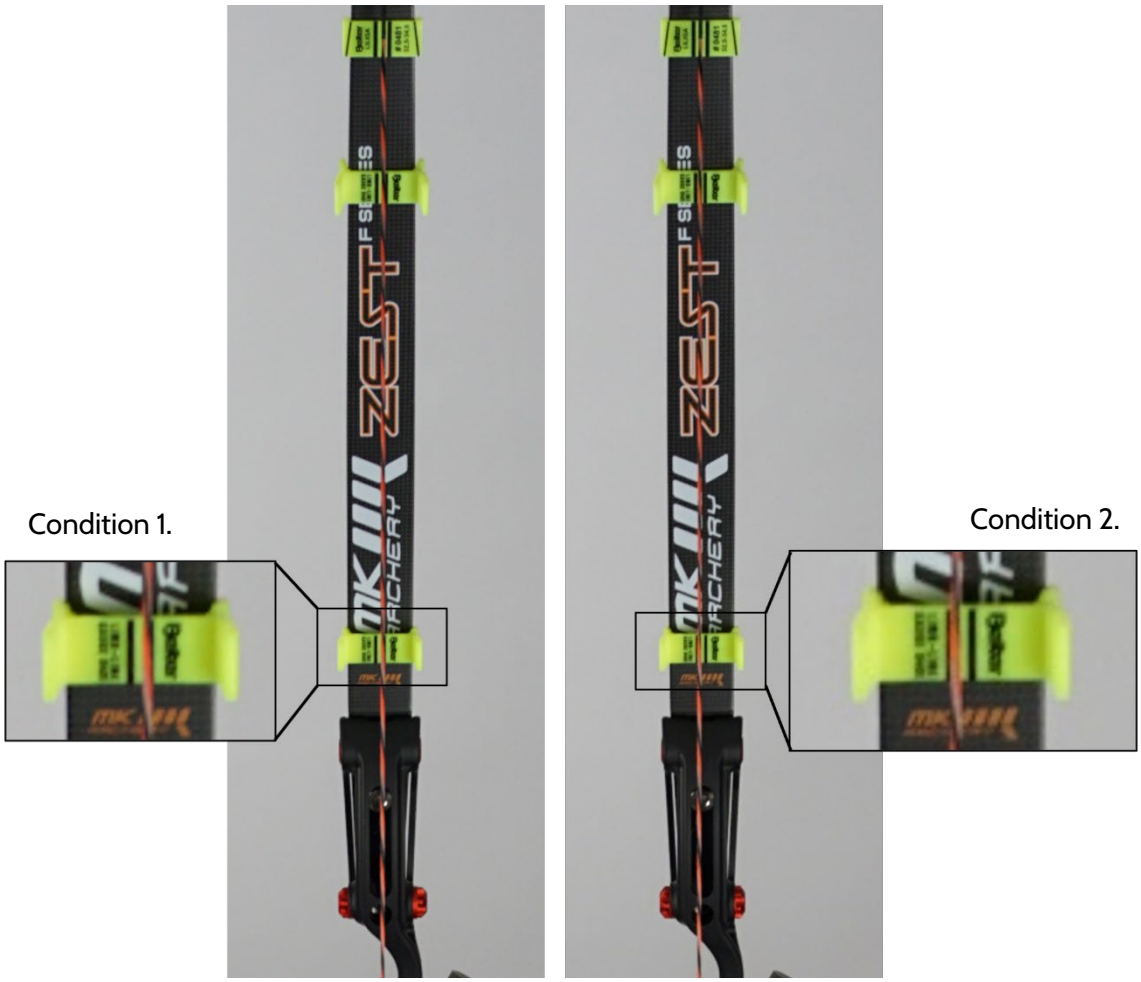


Figure 12: limb alignment

Condition 1.
The string is to the right of the center. The limb tip must be moved to the left. Take the F.L.A.T. tool and loosen the left adjustment screw. Tighten the right adjustment screw, the limb tip moves to the left.

Condition 2.
The string is to the left of the center. The limb tip must be moved to the right. Take the F.L.A.T. tool and loosen the right adjustment screw. Tighten the left adjustment screw, the limb tip moves to the right.

Figure 13: F.L.A.T. tool for limb alignment

2.6. The optimum position is reached when the string is centered in the limb gauges, centered over the riser and centered over the stabilizer.

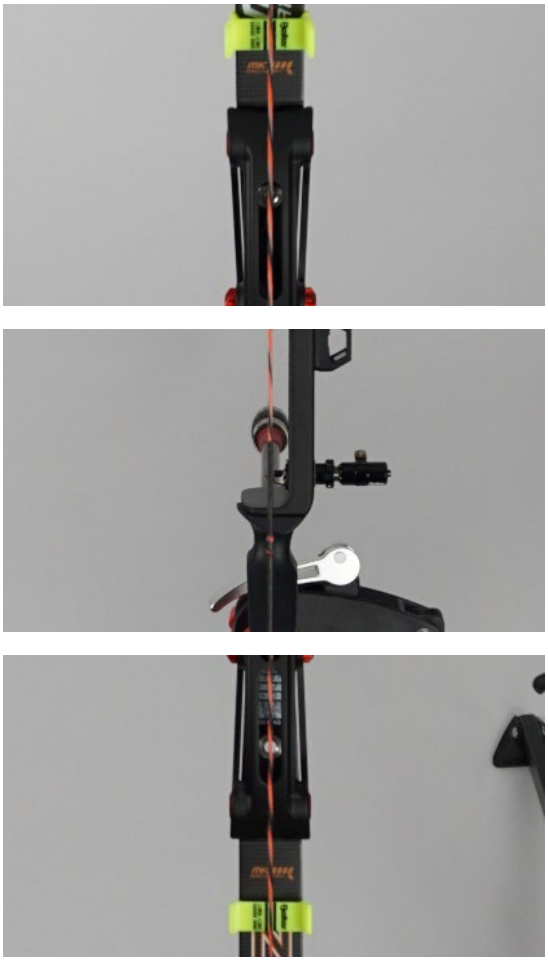


Figure 14: Ideal limb alignment

2.7. Once the desired position has been reached, tighten the opposite adjustment screws evenly with the F.L.A.T. tool.

ATTENTION: It is sufficient to tighten the side adjustment screws only slightly with the F.L.A.T. tool. Too much torque can damage the fine thread.

6.3.4 Center Shot

The last step in the basic setting is to adjust the center shot. The arrow must be set "on attack" at a slight angle to the outside. First nock an arrow and place it on the arrow rest. Align yourself behind the bow so that the string is centered over the riser. The arrow point should be about ¼ to ½ times the arrow diameter to the side of the string at an observation distance of ~1m. The positioning can be adjusted with the plunger.

NOTICE: Use a camera on a tripod for the adjustment process instead of just watching over the string with your eyes. This will give you a clearly defined image without any possible errors due to head movement.

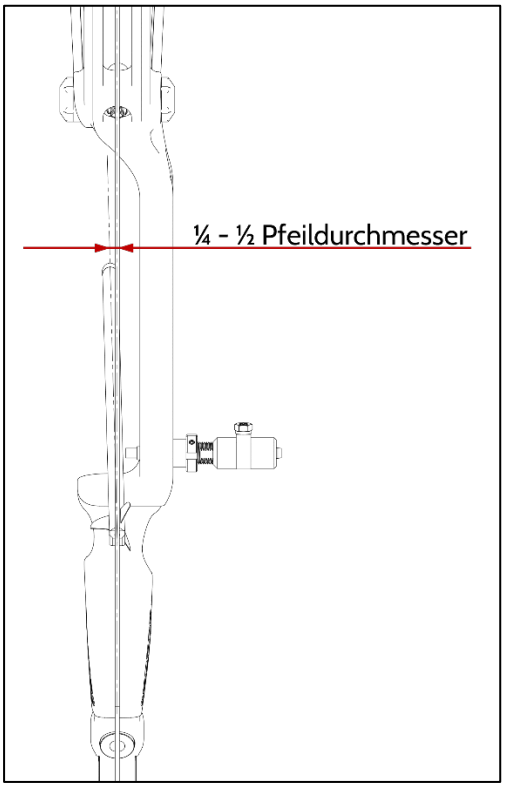


Figure 15: Center Shot

7 Cleaning

Cold or lukewarm water with commercially available detergents is suitable for cleaning the surfaces. We recommend using a microfiber cloth for cleaning.

8 Storage

Store your recurve riser in its original packaging in a dry, clean place at room temperature.