

Read the construction manual completely through prior to constructing!

(SERVOS, Not included in Kit)

Construction kit "Turn Coordinator"
Your kit contains all the necessary components (except for a servomotor) for building a "Turn Coordinator Gauge".

Fine-tuning

The calibration software allows you to accurately adjust the instrument (once connected to the Central Control Unit) to the movement of the indicators of the chosen instrument.

Difficulty level

This product can be constructed without technical expertise. Care and accuracy are of utmost importance.

What else do you need?

2 Servo motors of type HS300, HS311 or equivalent is required to make the instrument fully functional. This product can be ordered separately or bought from any retailer of model kits.

Additionally you will need some simple tools, such as a small star-shaped screwdriver, a hobby knife, some pliers, a soldering iron, insulating adhesive tape and glue suitable for plastic model kits.

General hints

Be very careful when using the hobby knife! You can easily hurt yourself when handling sharp objects! Take good care of the amount of glue you apply and to which areas you apply it. Glue for plastics is essentially a solvent. Excessive use can damage the exterior of the instrument.

Preparations before beginning construction

Check if all components are included. During packing, the contents of the construction kit have been inspected several times. Nothing should be missing.

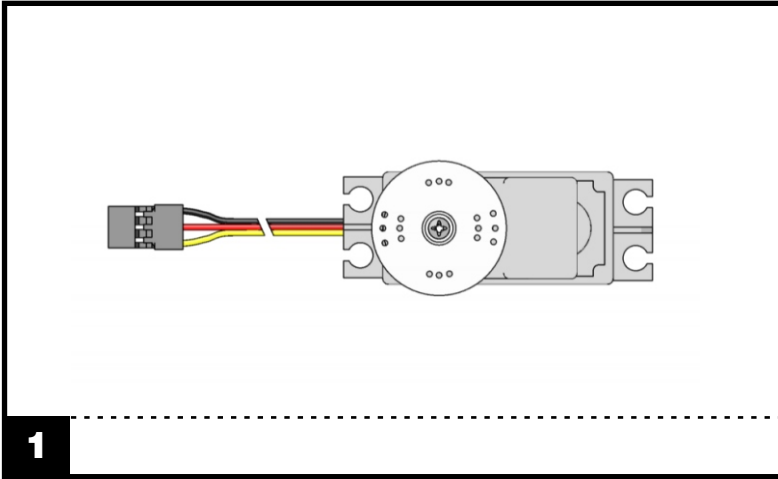
Use the hobby knife to remove any irregularities. Be careful when using the sharp hobby knife!

Warranty

Construction kits come without a warranty!

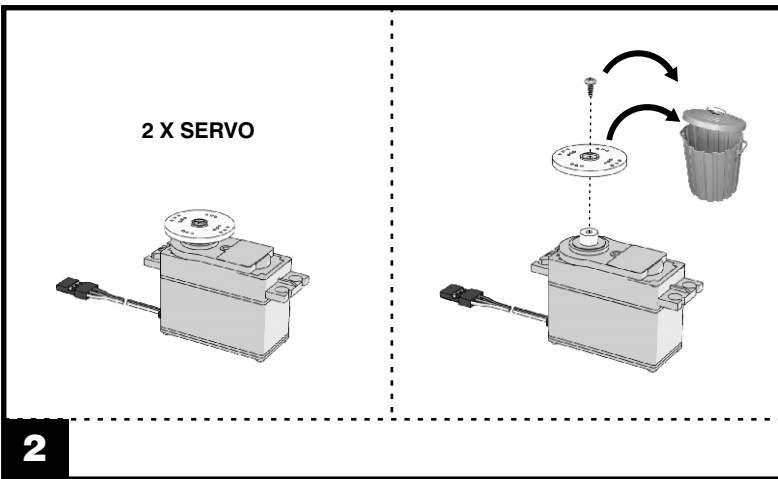
List of components

- A - Frontplate
- B - Front ring
- C - Backplate
- D - Optical (plastic, material PET) with imprinted edge and text
- E - Excentric
- F - Indicator
- G - Top of ball indicator
- H - Pendulum
- I - Bottom of ball indicator
- J - Strain relief
- K - Instrument casing
- L - Flatcable with connectors and light



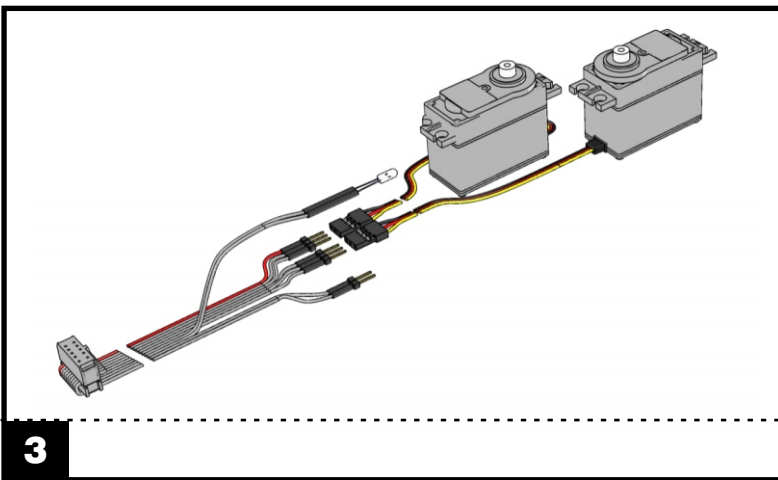
1

1. The servo shafts need to be positioned halfway. To achieve this, turn the already fitted disc left and right until it is positioned halfway. The servo shaft can be twisted approximately 150 degrees. Make sure the shaft remains in this position when assembling the Turn Coordinator!



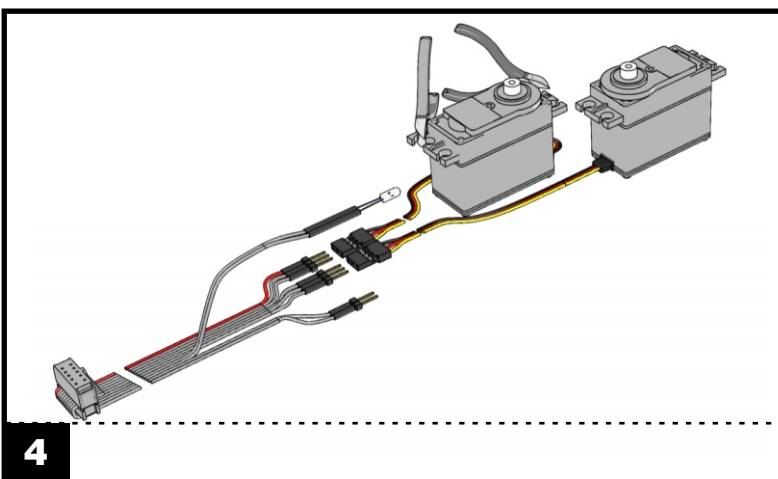
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2. Now remove the discs from the servos by unfastening the screws that hold them in place. Be careful not to change the position of the shaft!



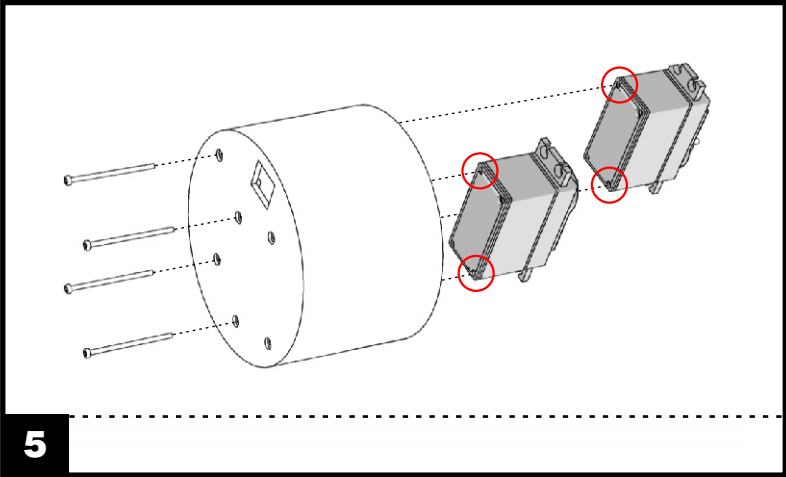
3

3. Connect both servos to the cable as shown in the illustration. Mind the polarities. The servo's black wire needs to be connected to the 1st (marked red on the flatcable) and to the 4th wire of the flatcable. The 2-pin connector is not used.

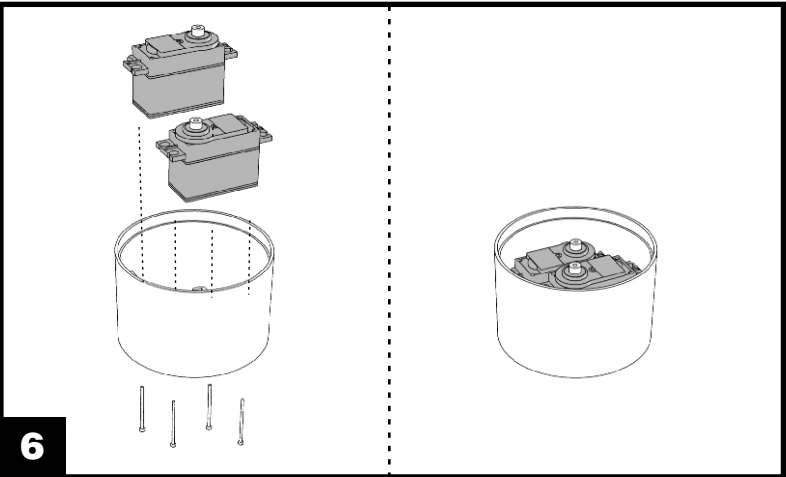


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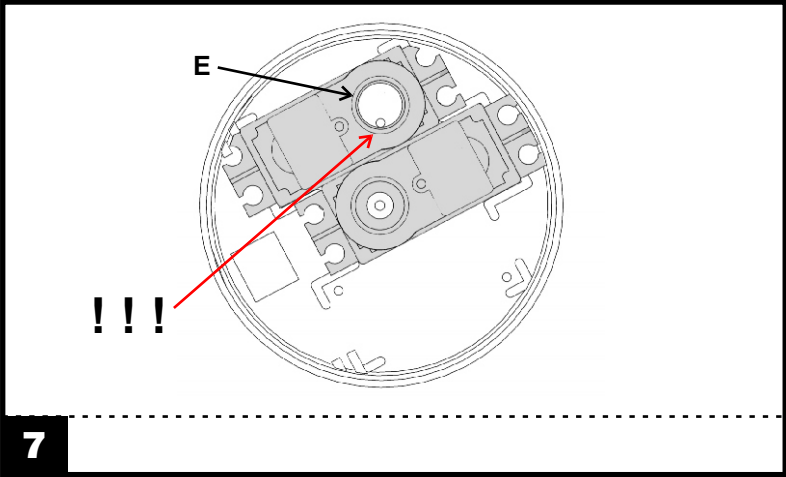
4. Using a pair of small pliers, cut the corners off the servo as indicated in the illustration.



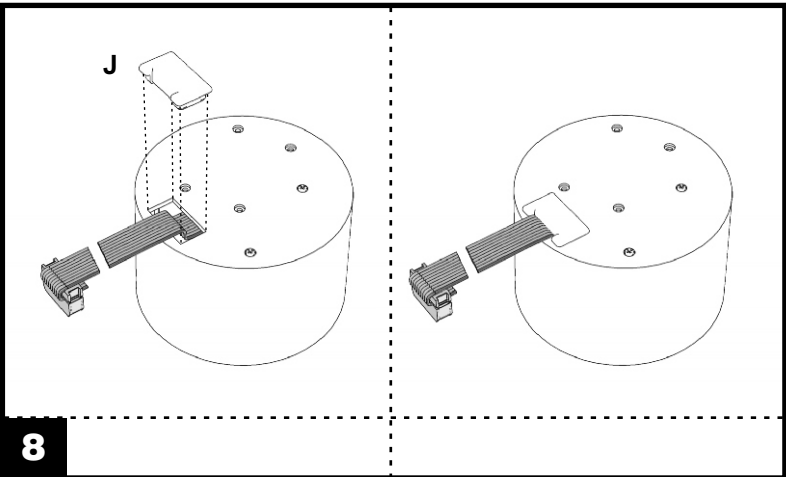
5. Disassemble two of the long screws that hold each servo together. Place the servo inside the instrument casing, in the position indicated in the illustration. Fix the servos to the casing using their own two screws.



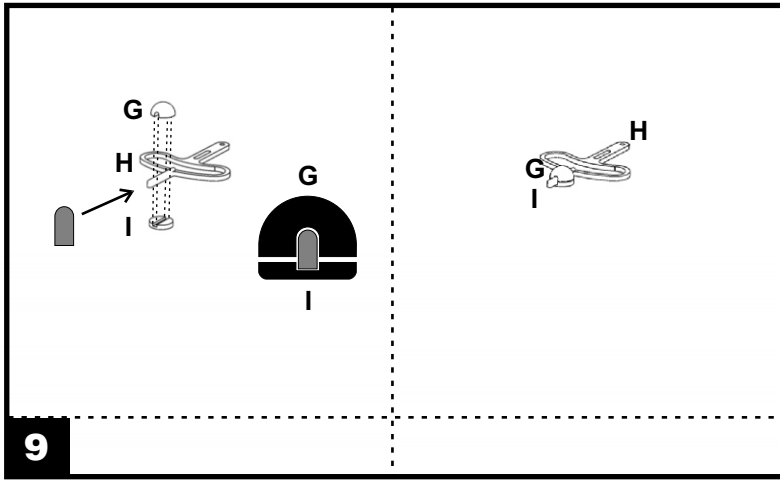
6. Be careful not to wind the screws too tightly. It's easy to damage the thread. Make sure the servo is properly positioned inside the instrument casing!



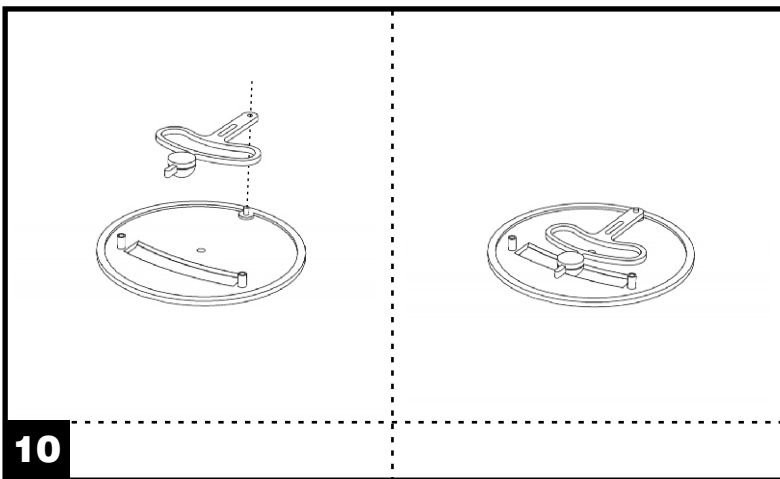
7. Mind the correct positioning of the servos in the instrument casing. The servo whose edges have been cut needs to be mounted against the side of the instrument casing. Now place eccentric E onto the shaft of the topmost servo. **Make sure not to change the halfway position of the servo. Press down the eccentric firmly, taking care not to damage the small protruding shaft.**



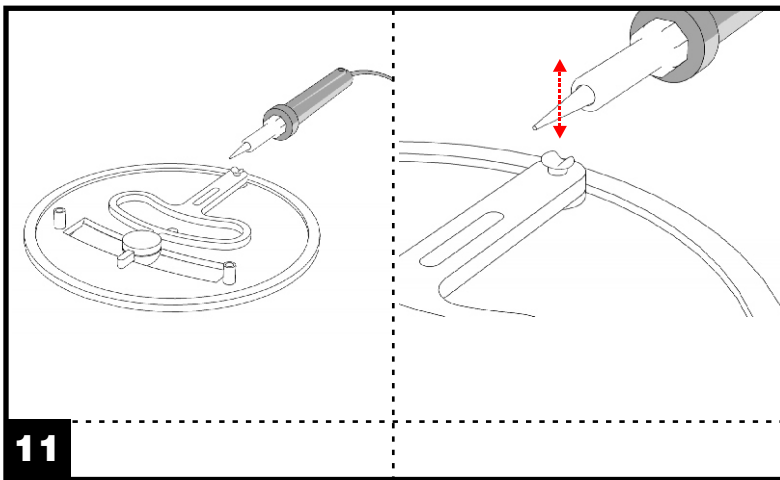
8. Pull the flatcable through the square hole in the bottom of the casing and press the strain relief (J) into the opening, in such a way that the flatcable is placed between the side of the casing's opening and the nook in the strain relief. Make sure to leave enough space on the inside of the instrument casing for the connection of the light, later on!



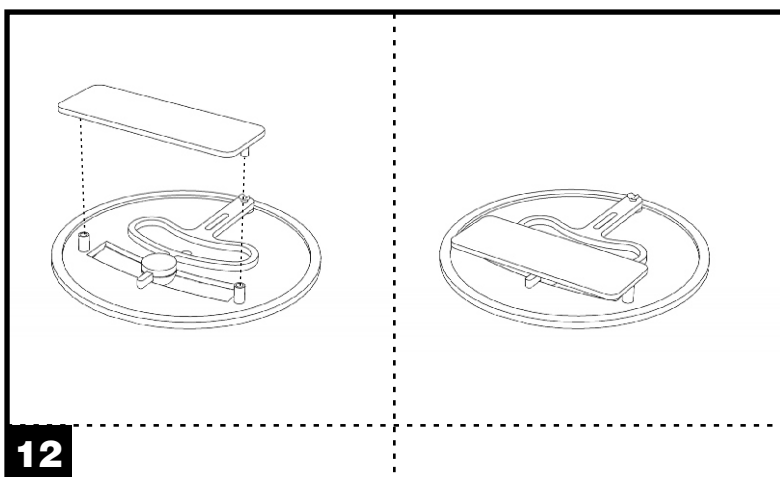
9. Assemble the pendulum by pressing together the spherical and the flat parts of the ball around the small rod of the pendulum. See the illustration for an indication. **Note: the thin part of pendulum H, across which glides the ball, has one spherical side. The opening of the ball part G also has one spherical side. These need to connect!** The ball will now glide easily across the rod without falling off.



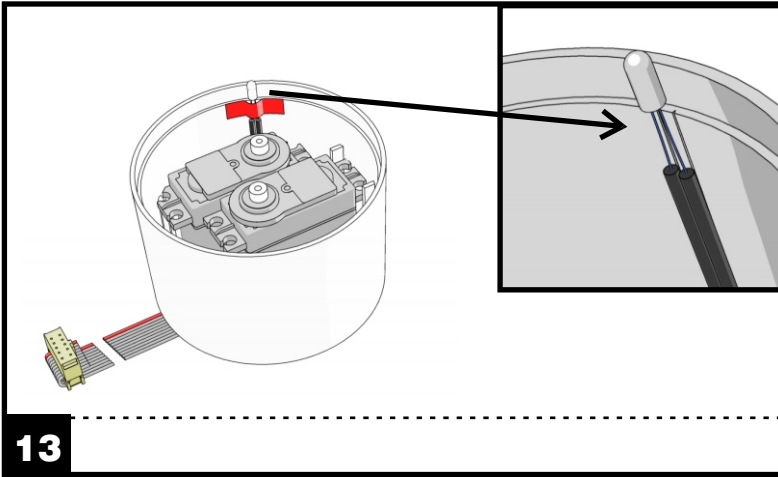
10. Place the pendulum onto the small plastic shaft on the reverse side of the faceplate, as indicated in the drawing. When placing the pendulum on the reverse side of the faceplate, the spherical side of the small black sphere needs to be positioned inside the transparent, bent indicator scale. Now check if the pendulum with the small black sphere can freely move back and forth inside the indicator scale. During this movement, the sphere will also cross the narrow part of the pendulum.



11. Take the soldering iron. Briefly and carefully press the side of the iron's tip down onto the protruding shaft around which hinges the pendulum. **Make sure the pendulum can continue to move freely. Just a slight deformation of the plastic is enough to secure the pendulum into place and to make sure it doesn't slide off the shaft.**



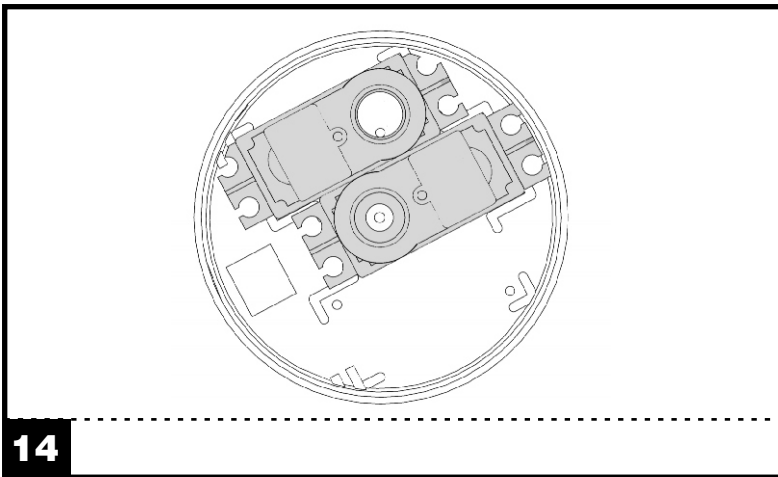
12. Now connect the oblong rear plate to the faceplate by pressing the two pins left and right of the rear plate onto the cases left and right of the transparent bent scale. Do this carefully! When this is done, evenly press the rear plate onto the front plate until you can't press it any further. The pendulum should now be able to move around freely.



13

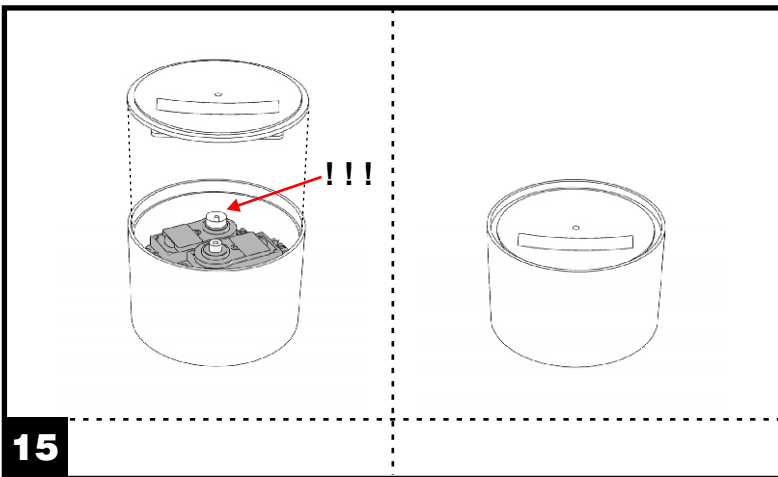
13. Cut a small piece of adhesive tape and place the light on the inside of the casing where you find two small grooves. Make sure the light doesn't protrude above the edge of the casing. **Be careful not to short-circuit the wires!!**

A small piece of adhesive tape will take care of any stray wires by sticking them to the inside of the casing bottom. It's important to avoid entangling the wires in the mechanism and the servomotor.



14

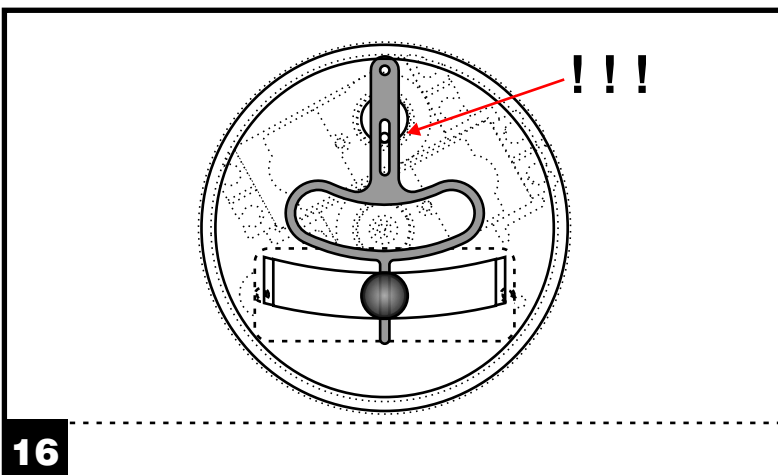
14. Position the instrument casing in front of you, in such a way that the servo shaft with eccentric is on top and the servo shaft of the second servo right beneath it.



15

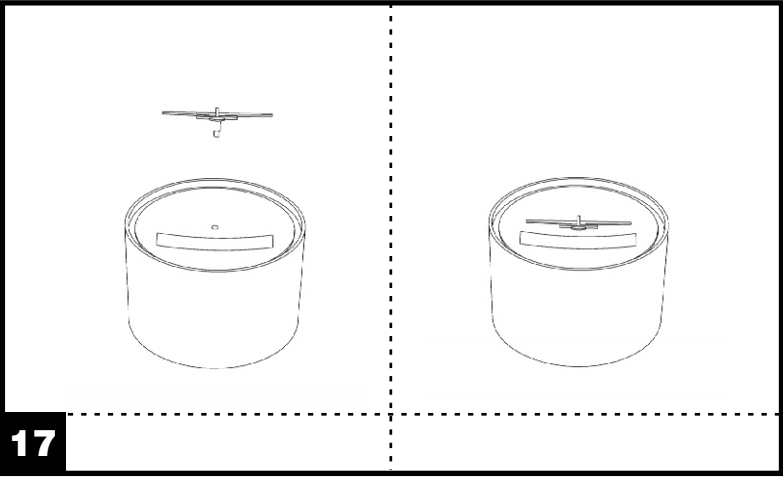
15. Now carefully connect the faceplate with the pendulum to the casing with the servomotors, in such a way that the eccentric's pin fits exactly into the groove of the pendulum as shown in the illustration.

The faceplate contains an indentation for the light as well as a small angular indentation for the centering notch (a small angular piece of plastic). Make sure the faceplate fits exactly onto these.



16

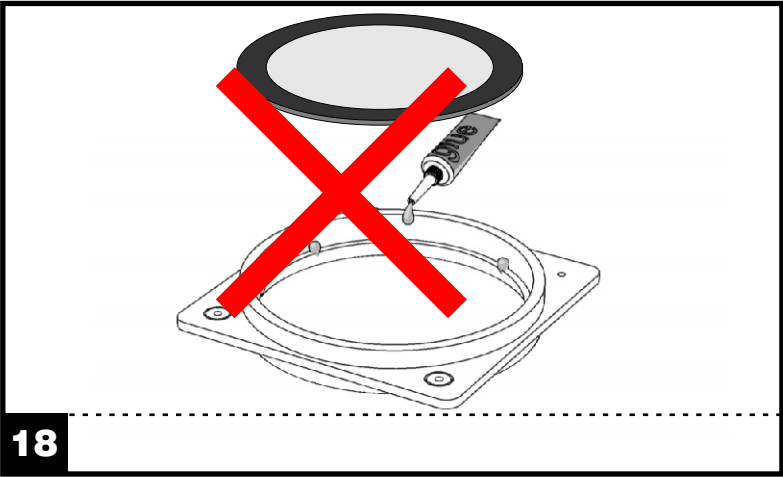
16. This illustration again shows the position of the eccentric and the pendulum after proper assembly of the product. In the illustration the faceplate has been made transparent for reasons of clarity.



17

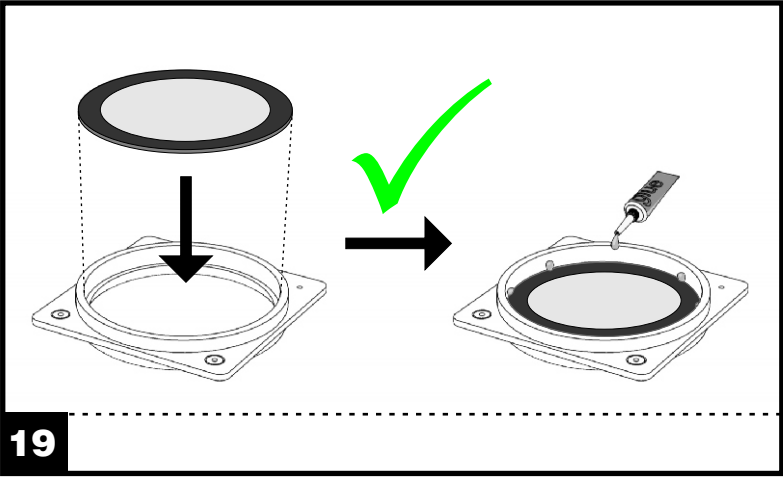
17. Now place the small plastic aeroplane in the center of the faceplate. Here again it is of vital importance that the position of the servo has not moved from its initial halfway position (see illustration 1). Press the aeroplane's central shaft into the screw casing of the servo shaft. Do this carefully. The aeroplane should not touch the front of the optical.

There is no need to use glue to mount the aeroplane onto the servo shaft.

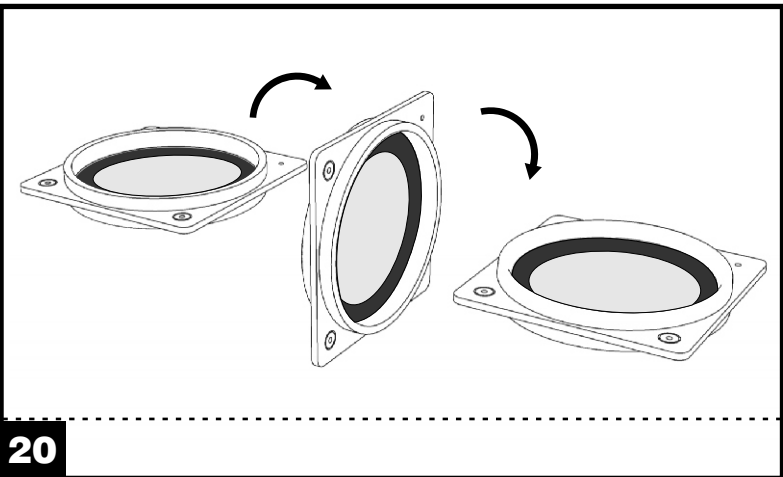


18

18/19. Placing and cementing the optical (made of PET material plastic) needs to be done with great care. First place the optical into the front ring as in illustration 19 (mind the nudge!) and only then cement the optical by carefully applying small drops of glue evenly along the inner edge between optical and front ring. Be careful, excessive use of glue can badly damage the optical. We recommend applying around 16 small drops when using viscose glue (thick glue). Thinner, more fluid glues will spread out and therefore require fewer drops. **Give the glue sufficient time (1 hour at least) to harden before continuing construction.**

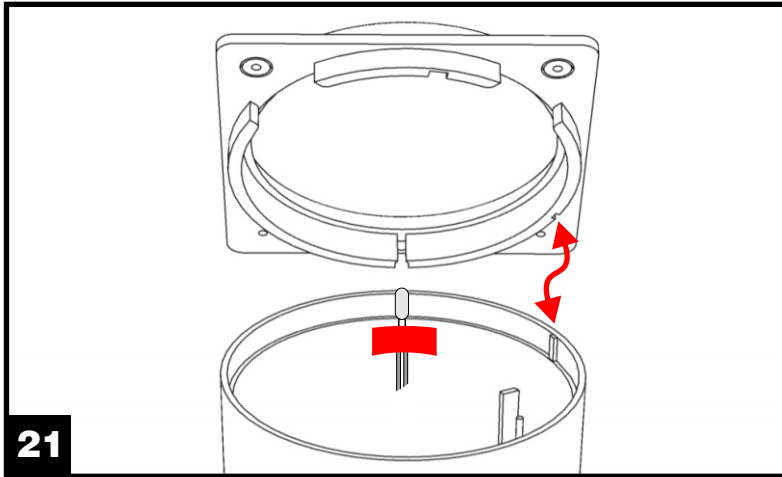


19

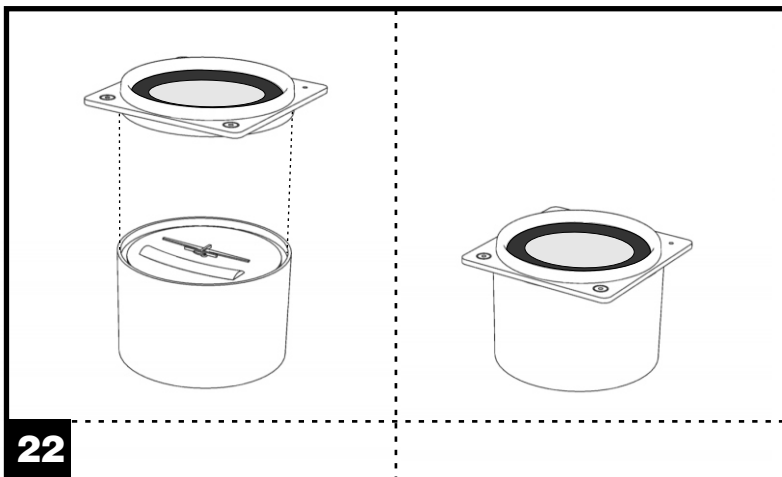


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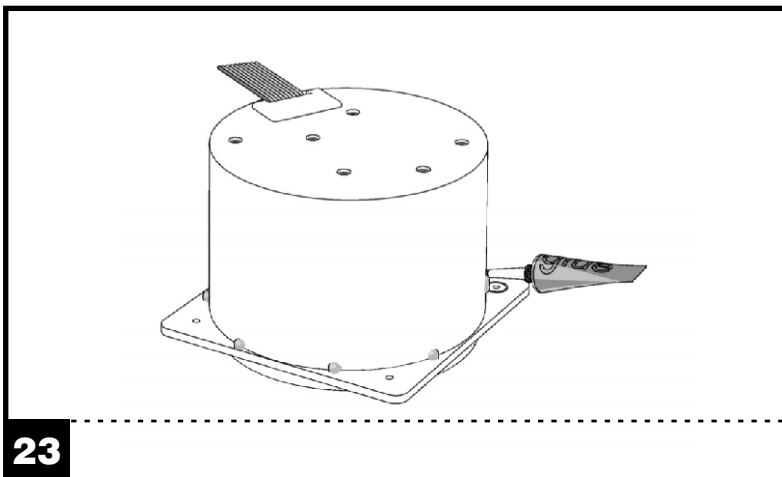
20. Turn over the front ring.



21. Connect the front ring with optical to the instrument casing in accordance with illustrations 21 and 22. Make sure the notches and light are placed in the indentations of the front ring. **Do not yet glue the front ring to the casing!**



22. First test the instrument by connecting it to the Central Control Unit and using the calibration software. Only when the instrument functions properly should you glue the front ring as shown in illustration 23.



23. The connection made with the glue will be invisible from the outside, which means you can make sure the instrument casing and front ring are attached firmly. We recommend applying glue in at least 8 spots around the front ring.

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