



Assembly Manual

Runout optimization and sanding instrument for slot car tires

Version 1.0 | Created by I3uLL3t

<https://rosi.i3ull3t.de>

ABOUT ROSI

Optimize runout. Sand tires under control.

Repeatable results for slot car tires.

ROSI is a compact, mostly 3D-printed tool for optimizing runout and sanding slot car tires. The axle is driven by an O-ring and a matching pulley. The sanding block is moved from left to right in the base guide, while the swing arm helps maintain even tire contact with the abrasive surface.

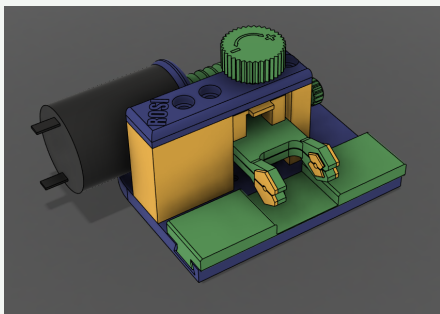
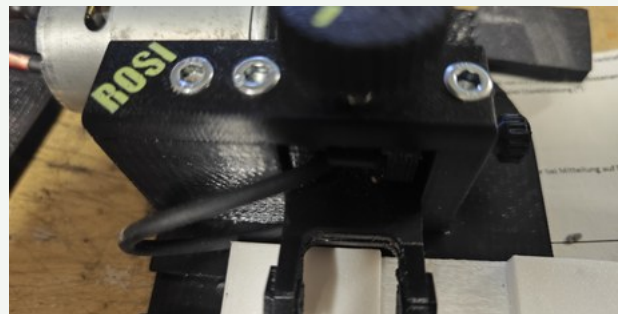


Fig. 1: Complete ROSI assembly.



Practical view of an assembled unit.

Scope of this manual

- Mechanical assembly of version 1.0
- Assembly and fitting of the moving components
- Basic calibration for even material removal
- Installation of pulleys for Carrera Digital 132 and other axles

Safety

- Disconnect the power supply before assembly, adjustment or cleaning.
- Wear safety glasses and keep hands away from rotating or heated parts.
- Keep long hair, clothing, cables and loose objects away from the motor, O-ring and axle.
- Remove sanding dust regularly and ensure good ventilation.
- Before operation, check all screws, bonded joints and pulleys for secure fit.

Affiliate link disclosure

The purchasing links in this manual are affiliate links and are marked accordingly. The creator may receive a commission when a purchase is made through one of these links, at no additional cost to you.

SOURCES

Purchasing list with affiliate links

Check dimensions and specifications before ordering.

No.	Component	Link
1	RS550 motor, 12 V / 10,000 rpm	amzn.to/4xedtqR (Affiliate link)
2	2 mm spring-steel wire	amzn.to/4bnIP6c (Affiliate link)
3	M3 screw assortment	amzn.to/4wDElvn (Affiliate link)
4	M5 screw assortment	amzn.to/4yQOP1b (Affiliate link)
5	M5 hex-head screw assortment	amzn.to/4xqjDa1 (Affiliate link)
6	50 mm O-ring	amzn.to/4pSRZNO (Affiliate link)
7	M2 heat-set insert assortment	amzn.to/4hMYOP0 (Affiliate link)
8	M2 screw assortment	amzn.to/4hOrBmd (Affiliate link)
9	M3 shim washers	amzn.to/45INKeo (Affiliate link)

Note

The listed assortments normally contain more parts than are required for one ROSI. The exact quantities are shown on the following pages.

EXACT PARTS LIST

Purchased parts and fasteners

Quantities required for one ROSI V1.0.

Qty.	Part	Use / specification
1x	RS550 motor, 12 V / 10,000 rpm	With 10-tooth pinion, Ø 8.8 mm, length 13 mm
2x	M3x8 to M3x10 screws	Motor mounting
5x	M3x10 socket-head screws	Column mounting
3x	M5x10 socket-head screws	Upper bridge
1x	M5x16 hex-head screw	Adjustment wheel / knob
2x	M3x20 socket-head screws	Swing-arm pressure bridge
2x	M3 nuts	Securing the M3x20 screws
2x	M2 heat-set inserts	Two-piece axle pulley
2x	M2x6 socket-head screws	Two-piece axle pulley
approx. 80 mm	2 mm spring-steel wire	Swing-arm shaft / locking pin
1x	50 mm O-ring	Drive belt
as required	M3 shim washers	Column calibration

Tools and supplies

- Suitable hex keys and spanners
- Cyanoacrylate adhesive, optionally with activator
- Fine abrasive paper for fitting the sanding block
- Side cutters, cut-off wheel or small saw for shortening the spring-steel wire
- Suitable pliers and a controlled heat source for fitting the swing-arm bore
- Soldering iron for M2 heat-set inserts
- Safety glasses

EXACT PARTS LIST

3D-printed parts

File names are retained exactly as supplied with the model files.

Qty.	File name / part	Purpose
1x	Basis	Main base
1x	Brücke	Upper connection between the columns
2x	Gleitlager_oben_rechts_unten_links	Slide-bearing variant A
2x	Gleitlager_unten_rechts_oben_links	Slide-bearing variant B
1x	Knob (Verstellrad)	Adjustment wheel for contact pressure
1x	Knob_Welle_Schwinge	Knob for the swing-arm shaft
1x	Pressbrücke	Retaining bridge above the swing arm
1x	Riemen_rolle_RS550	Pulley for the specified RS550 motor
1x	Riemenrolle_div_1	Half 1 of the universal axle pulley
1x	Riemenrolle_div_2	Half 2 of the universal axle pulley
1x	Säule Links	Left column
1x	Säule Rechts	Right column
1x or several	Schleifer	Print one for each required abrasive grit
1x	Schwinge	Slot car axle support / swing arm

Optional for Carrera Digital 132 models

Qty.	File name / part	Purpose
1x	Riemenrolle_132_Achse_hinten_1	Half 1
1x	Riemenrolle_132_Achse_hinten_2	Half 2

Practical tip

Prepare and clearly label several sanding blocks with different abrasive grits. This allows the grit to be changed without replacing the abrasive paper each time.

1**ASSEMBLY**

Assembly overview

First familiarize yourself with the arrangement of the assemblies. The motor and bridge structure sit on the base; the swing arm and sanding block are located in the front working area.

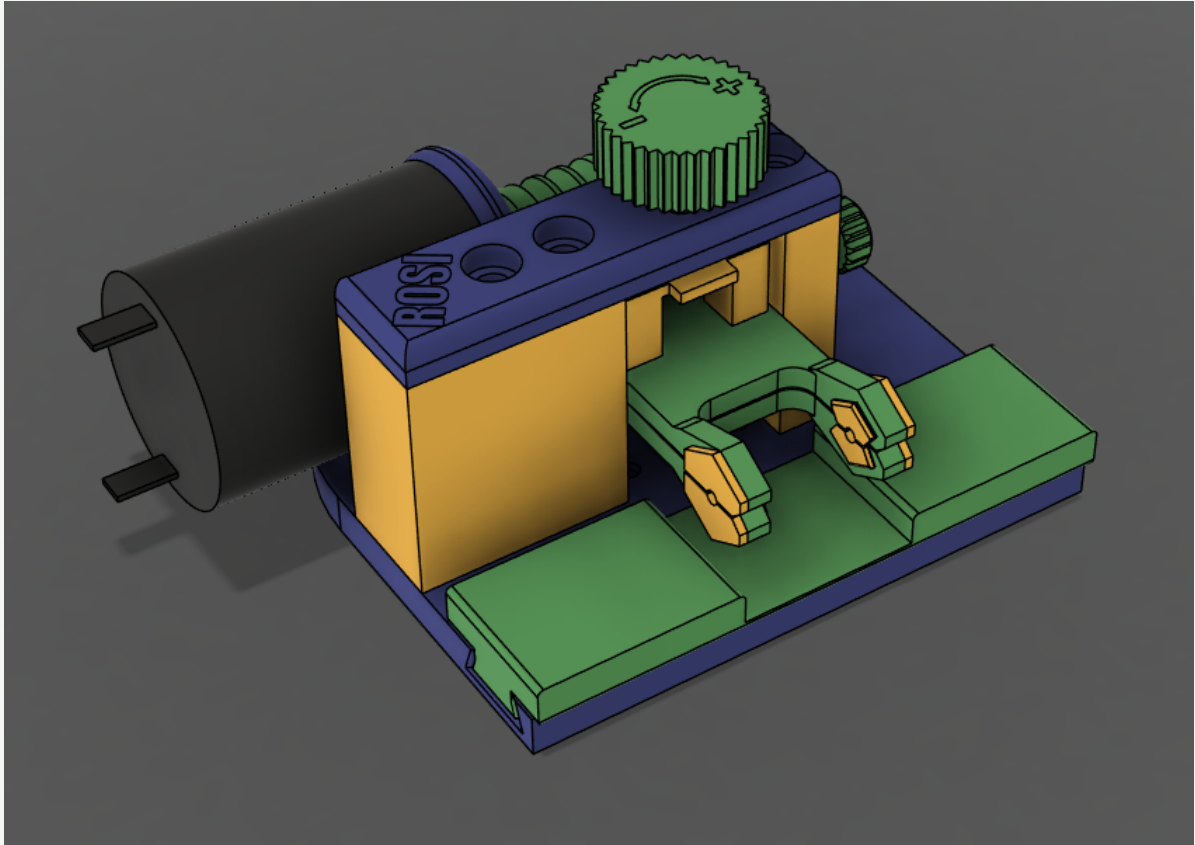


Fig. 1: Fully assembled ROSI.

ASSEMBLY

2

Prepare the base

All other components are mounted on the base. The motor is fixed at the rear; the sanding block runs in the front guide and is later moved manually to the left and right. The red mounting points are important for calibration: if both tires do not contact the sanding block evenly, one of the side columns can be shimmed there using thin M3 washers.

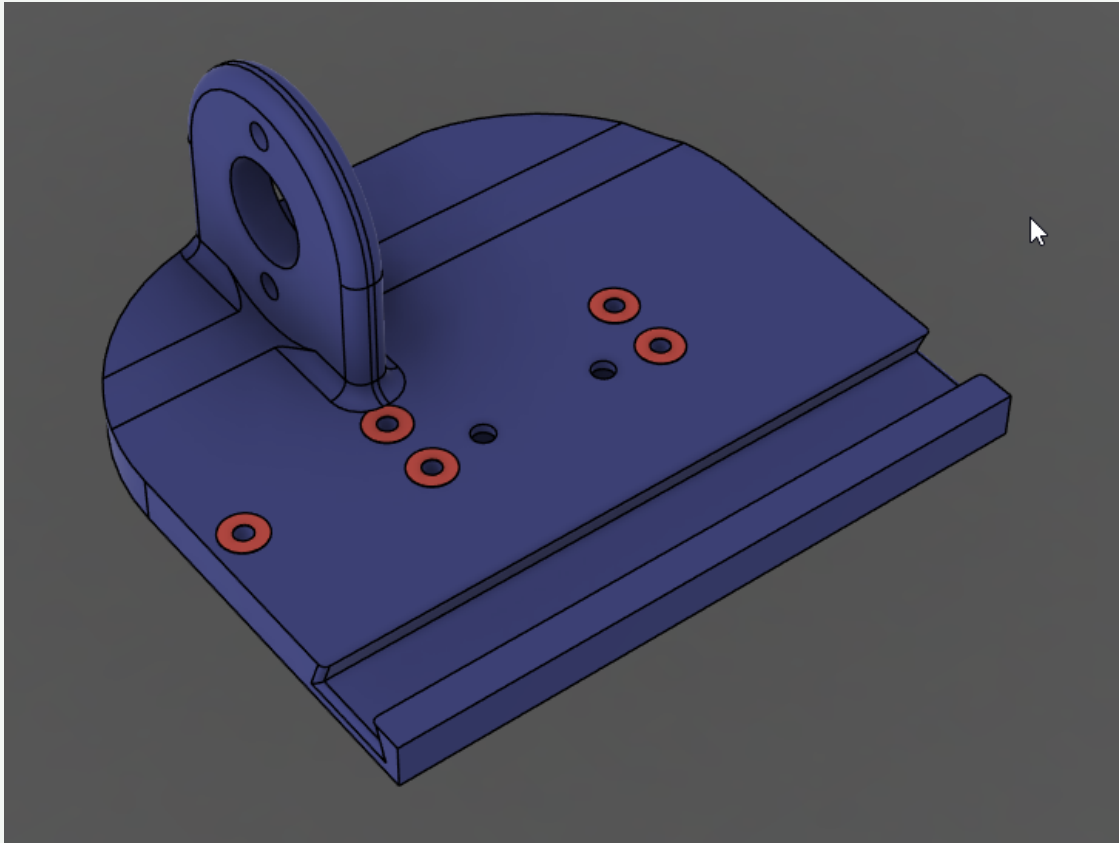


Fig. 2: Base with marked shim locations.

Note

Install shim washers only after complete assembly. First assemble without shims and check the material removal.

ASSEMBLY

3

Install the motor

Fasten the RS550 motor to the base using two M3x8 to M3x10 screws. Then push the 3D-printed motor pulley fully onto the 10-tooth pinion supplied on the motor. The pinion is not visible in Fig. 3, but it is fitted as standard to the motor available through the specified affiliate link. The pinion teeth cut into the printed fit and create a secure connection. Push the pulley fully home to prevent eccentric running.

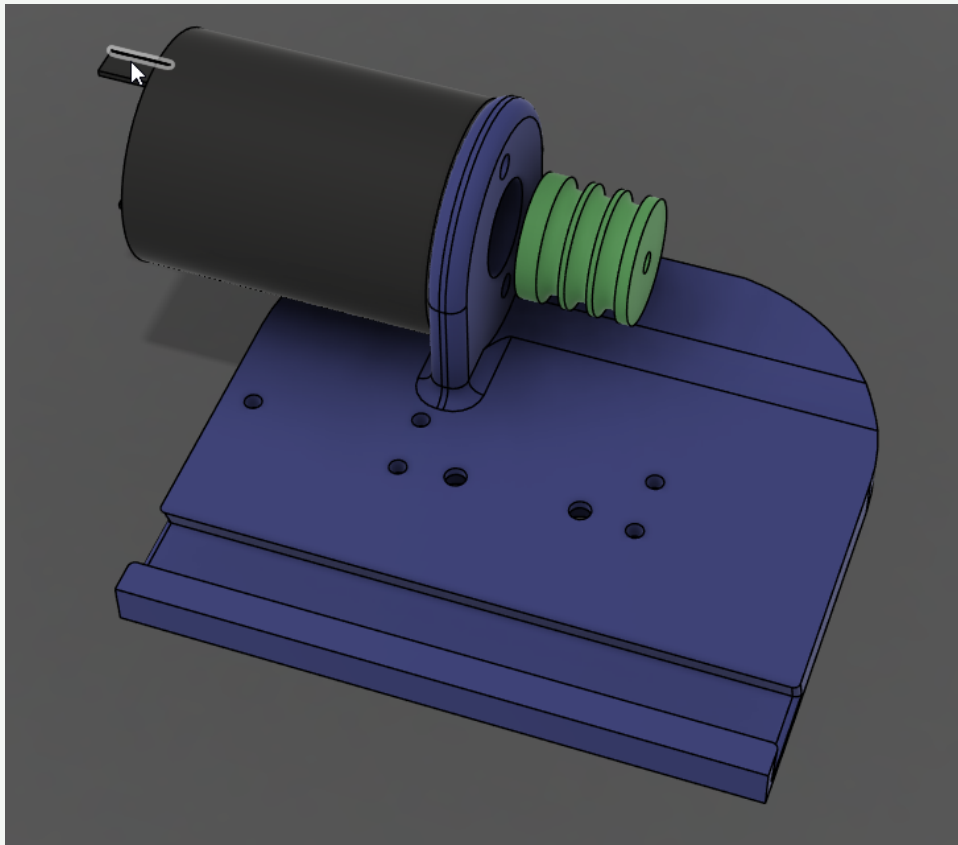


Fig. 3: Motor and pulley on the base.

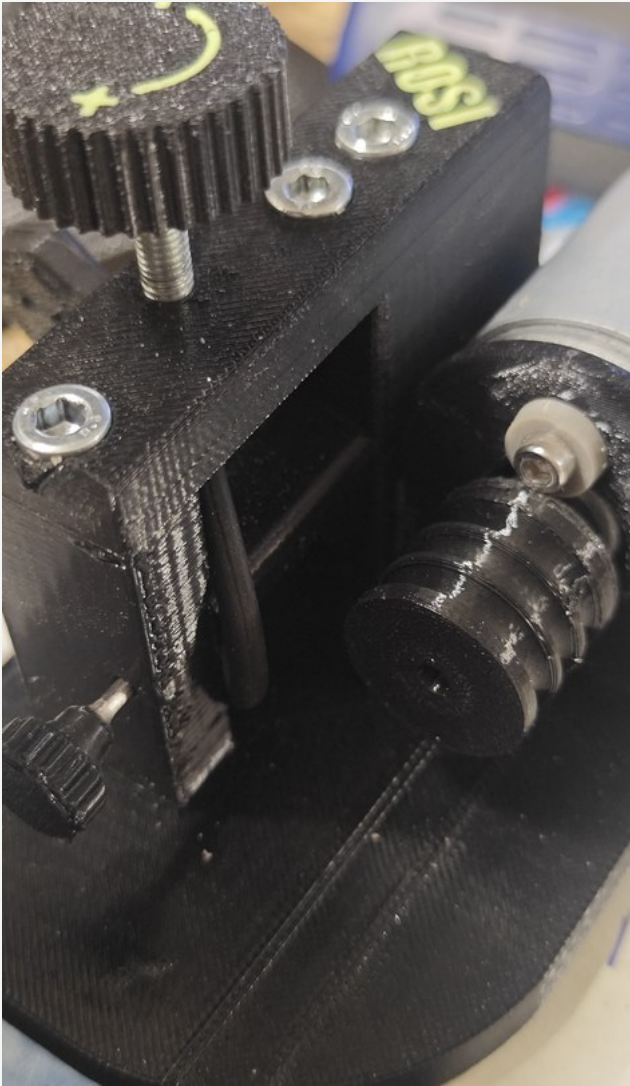
Other motors

Versions of the base and motor pulley for other motors can be arranged. Contact me through MakerWorld.

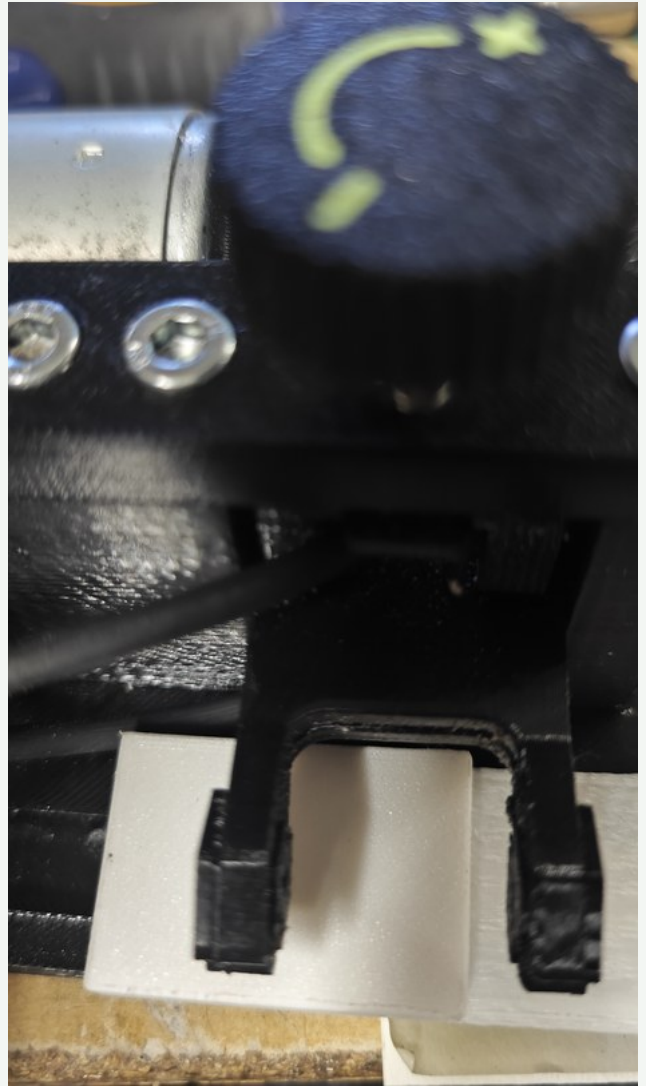
PRACTICAL DETAILS

Motor pulley and assembled unit

Checking fit and alignment.



Practical view of the fully seated motor pulley.



Practical view of the motor and bridge assembly.

Check

The pulley should sit as straight as possible on the motor shaft. Even a small tilt can cause the O-ring to run unevenly.

4**ASSEMBLY****Fasten the columns**

Place the two side columns in their intended positions and fasten them from the underside of the base using a total of five M3x10 socket-head screws.

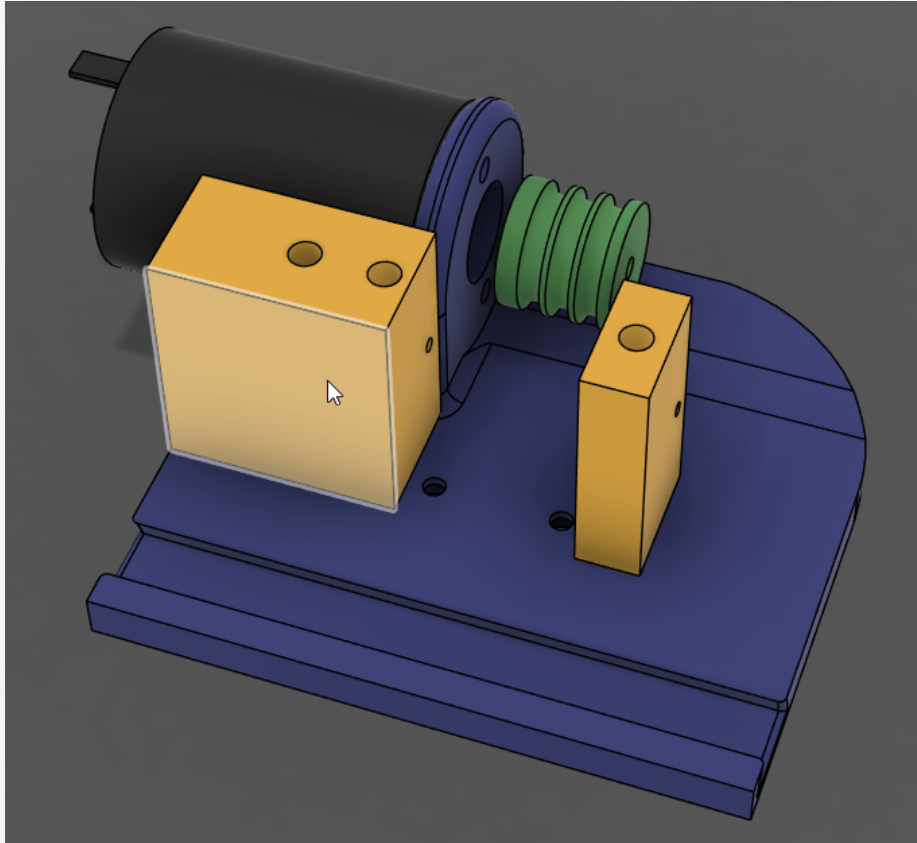


Fig. 4: Columns on the base.

ASSEMBLY

5

Prepare the adjustment wheel

Apply a small amount of cyanoacrylate adhesive to the hexagonal recess of the knob. Insert the M5x16 hex-head screw straight and fully into the recess. Make sure the screw is not tilted. A suitable activator can speed up curing.

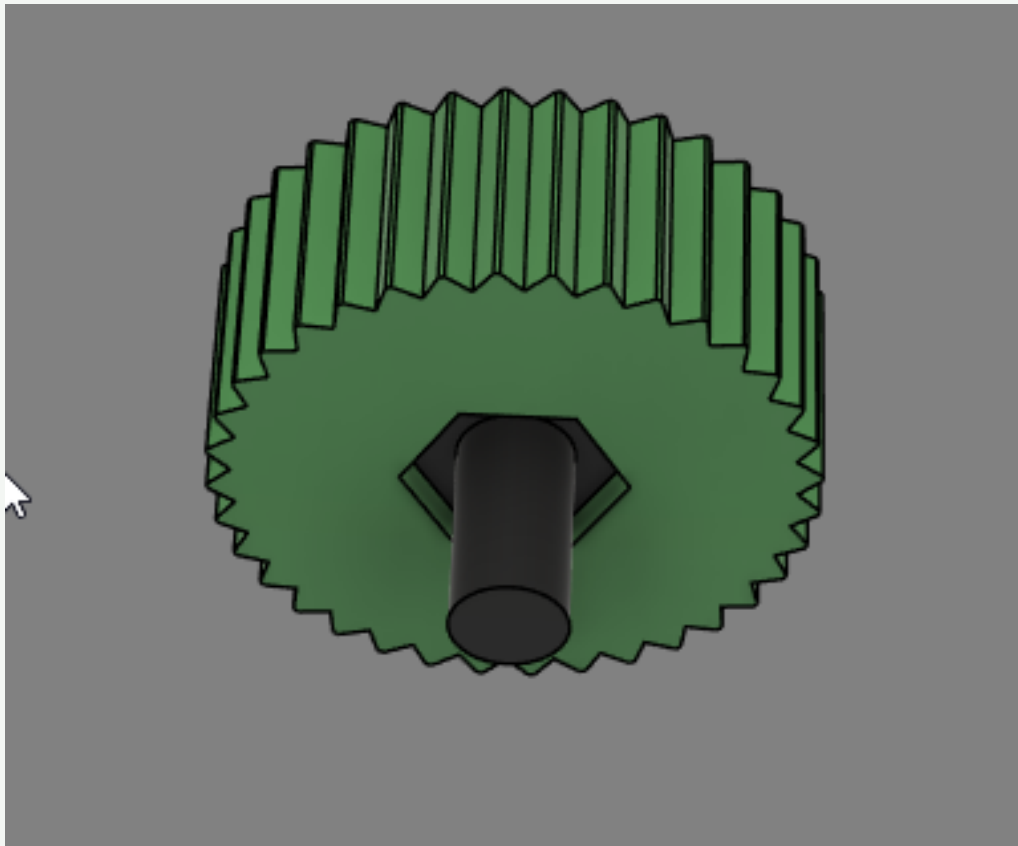


Fig. 5: M5x16 hex-head screw in the knob.

Note

Do not allow adhesive to enter the thread. Let the joint cure completely before loading the knob.

6

ASSEMBLY

Install the upper bridge

Place the bridge on the two columns. Align it without tension and fasten it using three M5x10 socket-head screws.

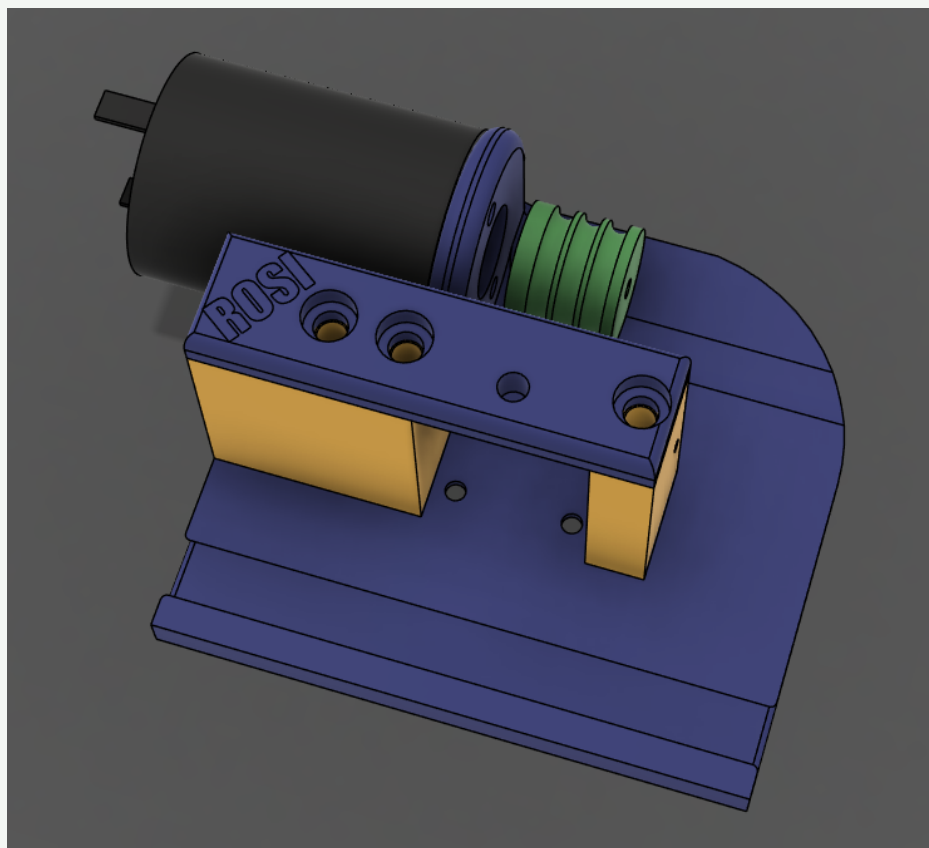


Fig. 6: Bridge on the columns.

7

ASSEMBLY

Screw in the adjustment wheel

Screw the prepared knob into the bridge from above, but do not screw it all the way through at first. Turn it in and out several times so that the thread forms cleanly in the plastic and moves smoothly afterwards.

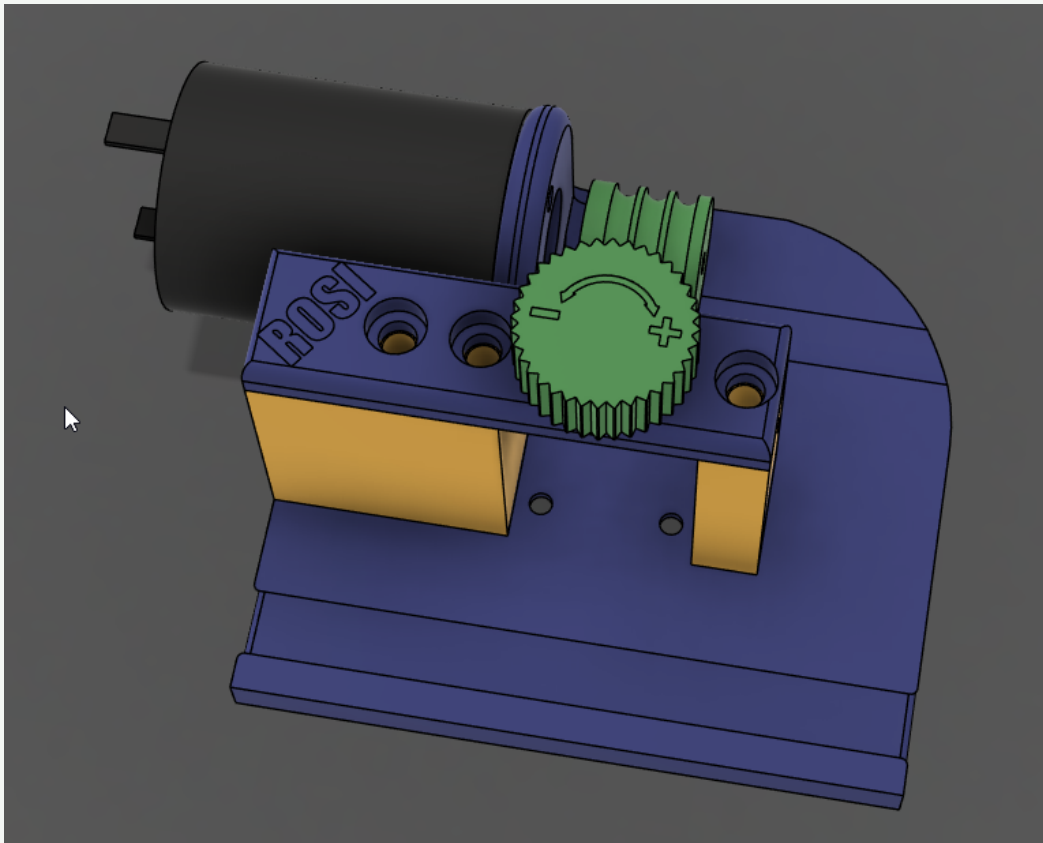


Fig. 7: Knob screwed into the bridge.

Note

Do not force the thread. If resistance is high, back it out, remove debris and carefully try again.

8

ASSEMBLY

Install the slide bearings

Press all four slide bearings fully into the intended recesses in the swing arm. Make sure the two bearing variants are assigned correctly. The slide bearings are wear parts and can be replaced when required; printing spares is recommended.

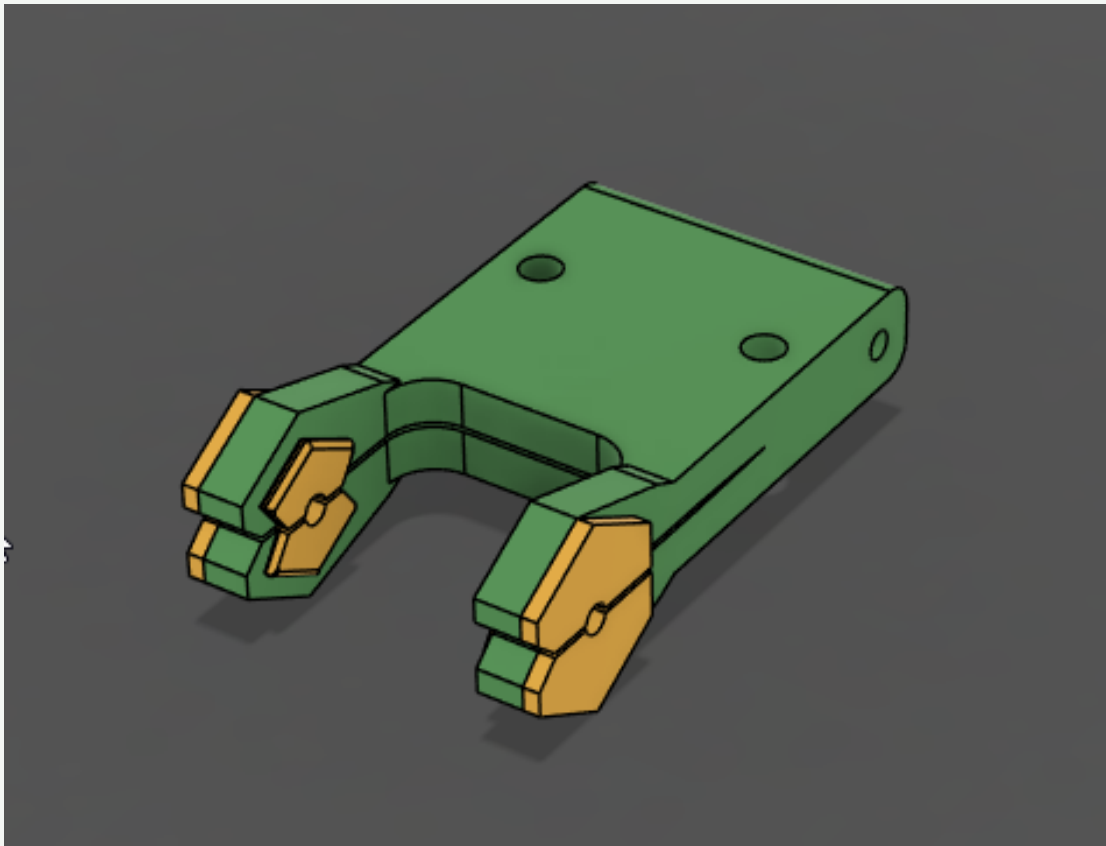


Fig. 8: Slide bearings installed in the swing arm.

ASSEMBLY

9

Install the O-ring and pressure bridge

First place the 50 mm O-ring around the swing arm. Then fit the pressure bridge. Fasten it using two M3x20 socket-head screws and secure the screws from below with two M3 nuts.

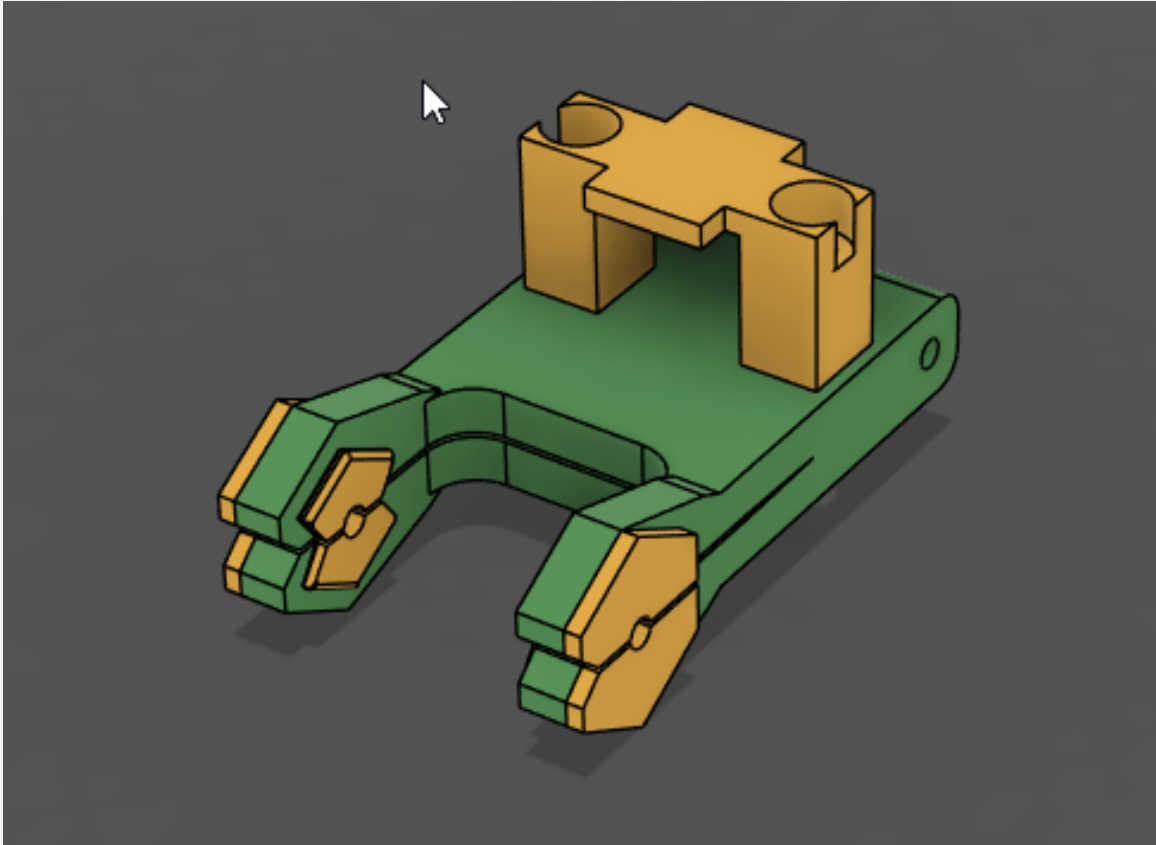


Fig. 9: O-ring beneath the installed pressure bridge.

Note

The O-ring must be inserted before the bridge is fastened. Check that it is not trapped or twisted.

ASSEMBLY

10

Fit the spring-steel shaft and bore

Cut the 2 mm spring-steel wire to approximately 80 mm. Slide the Knob_Welle_Schwinge onto the outer end and bond it in place. To obtain a bore with as little play as possible, carefully heat the spring-steel wire and push it through the swing arm a little at a time. Check the fit after each section. Depending on the fit, the heating process may need to be repeated several times until the wire moves smoothly without perceptible play.

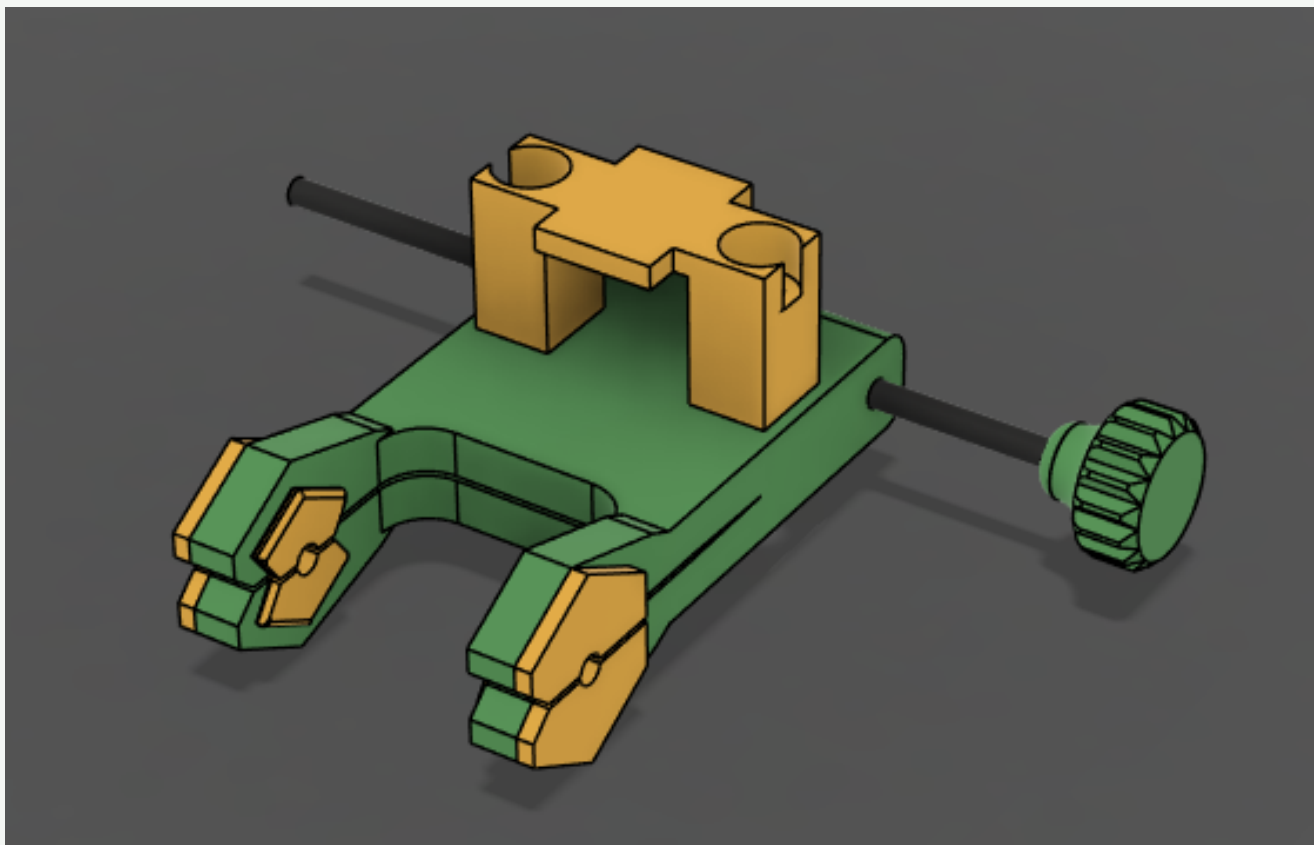


Fig. 10: Spring-steel shaft with Knob_Welle_Schwinge.

Caution

The spring steel and adjacent components can become very hot. Use suitable pliers, allow the wire to cool before checking the fit and avoid unnecessarily overheating the plastic.

ASSEMBLY

11

Install and lock the swing arm

Place the preassembled swing arm between the columns and beneath the bridge. Align the bores and push the fitted spring-steel shaft fully through. The swing arm must move freely, but it must not wobble sideways or vertically. Play at this point can cause vibration and reduce sanding quality.

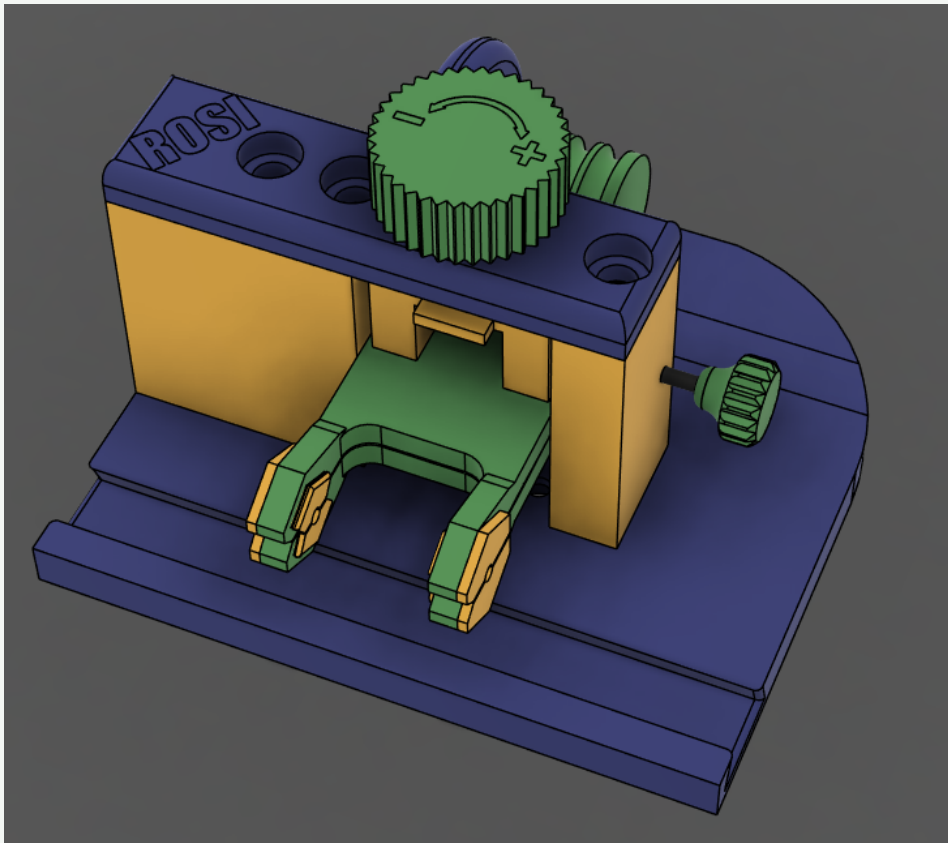


Fig. 11: Swing arm installed and locked.

Check

Move the swing arm several times through its full range. It should move smoothly without binding or perceptible play in any direction.

12**ASSEMBLY**

Fit the sanding block and install abrasive paper

Two flat runners are located on the underside of the sanding block. Draw these runners evenly over fine abrasive paper and remove only a small amount of material on each pass. Check the fit regularly until the sanding block moves smoothly through the base guide with as little play as possible. Once the fit is correct, attach abrasive paper of the required grit to the two raised surfaces on the top, to the right and left of the sanding block.

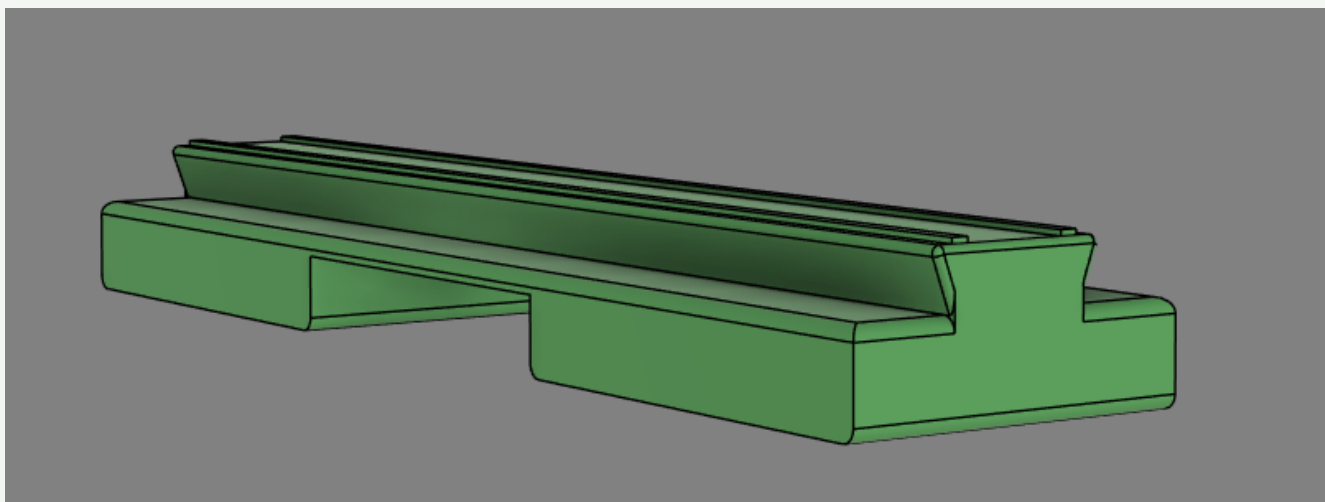


Fig. 12: Runners on the underside of the sanding block.

Practical tip

Preparing several sanding blocks for different grits is recommended. Material removed from the runners cannot be replaced, so always work in small steps.

ASSEMBLY

13

Insert and check the sanding block

Insert the fitted sanding block with its abrasive paper into the base guide. It should move left and right over its entire travel without binding while having as little side play as possible.

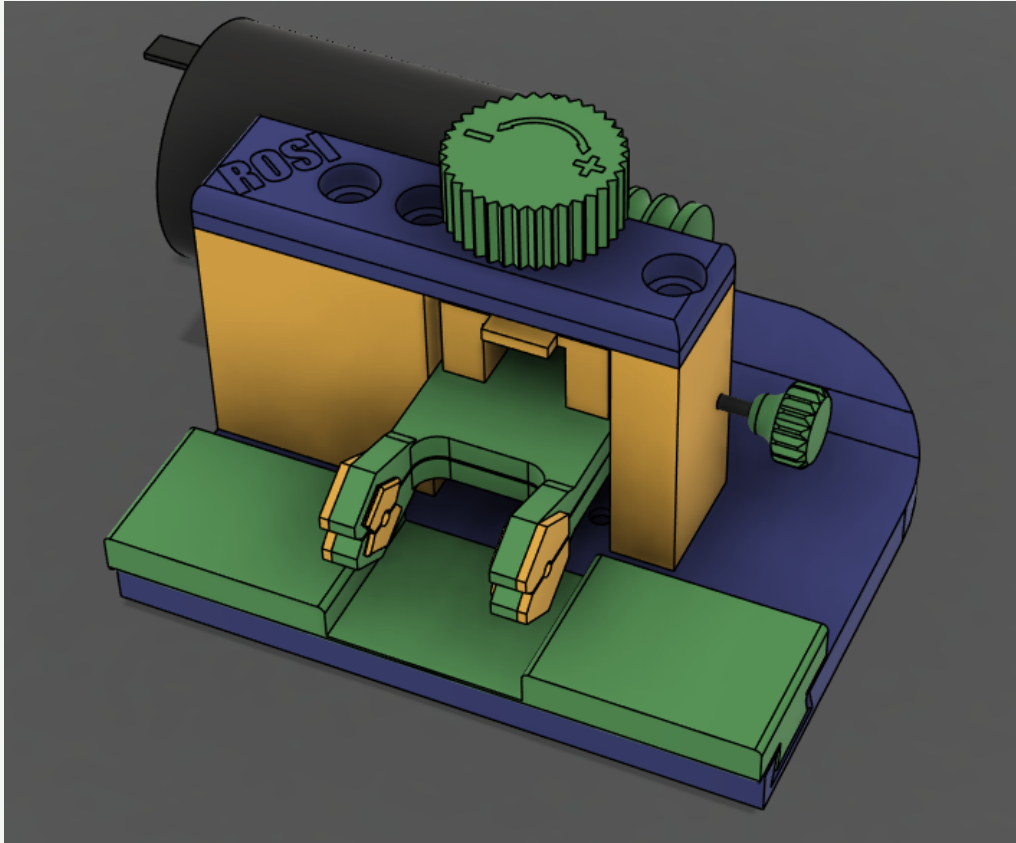


Fig. 13: Sanding block in the base guide.

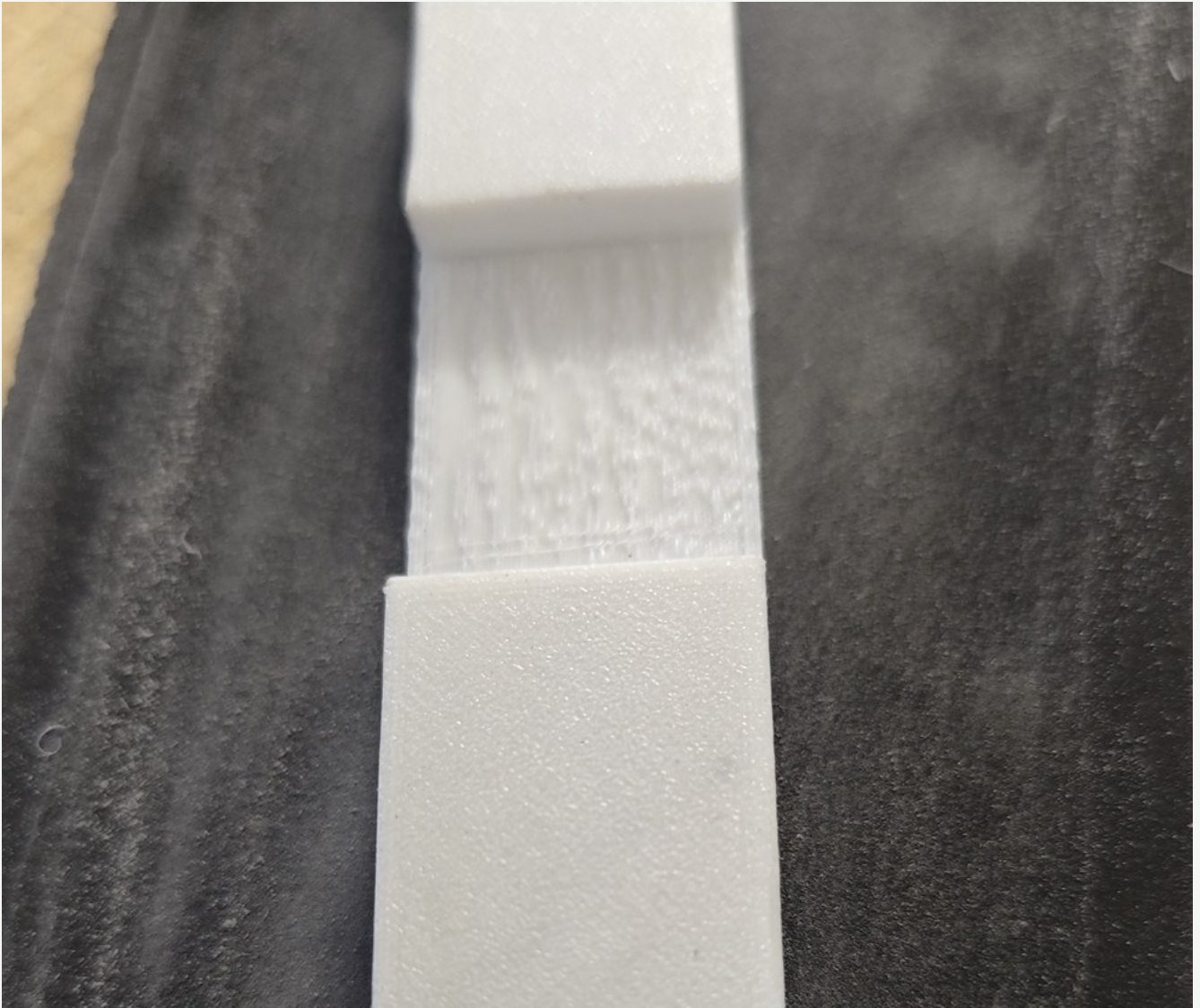
Check

Guide the sanding block straight and check that the abrasive paper does not rub against the base or lift at an edge.

PRACTICAL DETAIL

Calibrate the sanding block for a play-free fit

Fit the runners in small steps.



Practical view: fitting the sanding-block runners on fine abrasive paper.

Tip

Keep the sanding block straight while fitting and compare material removal on both runners regularly. Recheck the fit in the base after every short sanding operation.

CALIBRATION AFTER ASSEMBLY

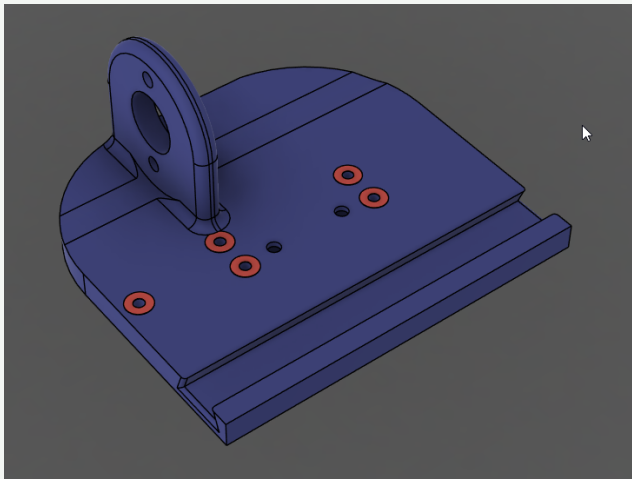
Set even material removal

Aligning the axle parallel to the abrasive surface.

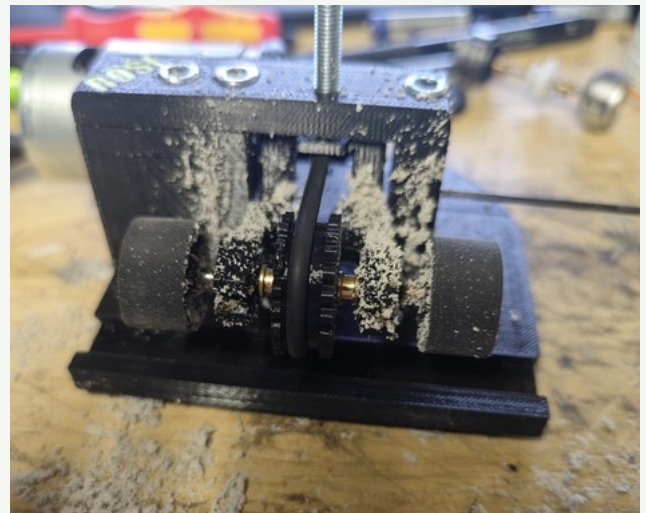
After assembly, check whether both tires are sanded evenly across their width and on both sides. Uneven material removal indicates that the axle is not exactly parallel to the abrasive surface.

Procedure

- Fit a straight axle with a suitable pulley and two comparable tires.
- Run the tires briefly over the sanding block using low contact pressure.
- Inspect the sanding pattern on both tires.
- If removal is uneven, loosen the affected column and place one or more thin M3 shim washers beneath it at the locations marked in Fig. 2.
- Tighten the screws evenly and repeat the test until both tires contact the abrasive surface evenly.



Column calibration points.



Practical view during sanding.

Fine adjustment

Even very thin shim washers can noticeably change the result. Make only one small change at a time and then test again.

ASSEMBLY

14**Pulley for Carrera Digital 132**

The pulley for Carrera Digital 132 rear axles is placed around the axle and screwed together. This provides secure, gentle power transmission without permanently modifying the axle.

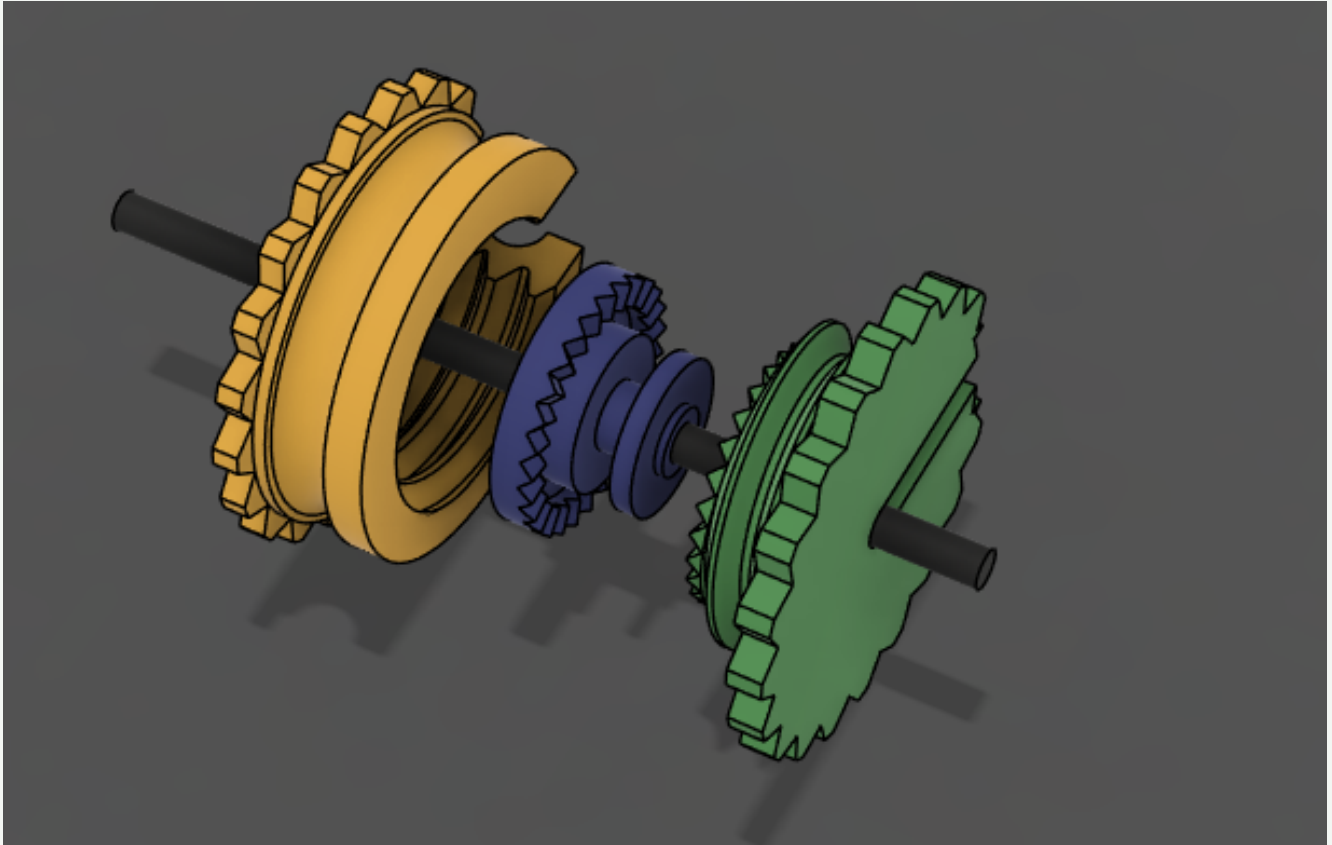


Fig. 14: Assembly principle of the Carrera 132 axle pulley.

ASSEMBLY

15**Two-piece pulley for other axles**

Install two M2 heat-set inserts in one half of the two-piece pulley. Place both halves around the axle and fasten them using two M2x6 socket-head screws. Tighten the screws evenly and only enough to clamp the pulley securely.

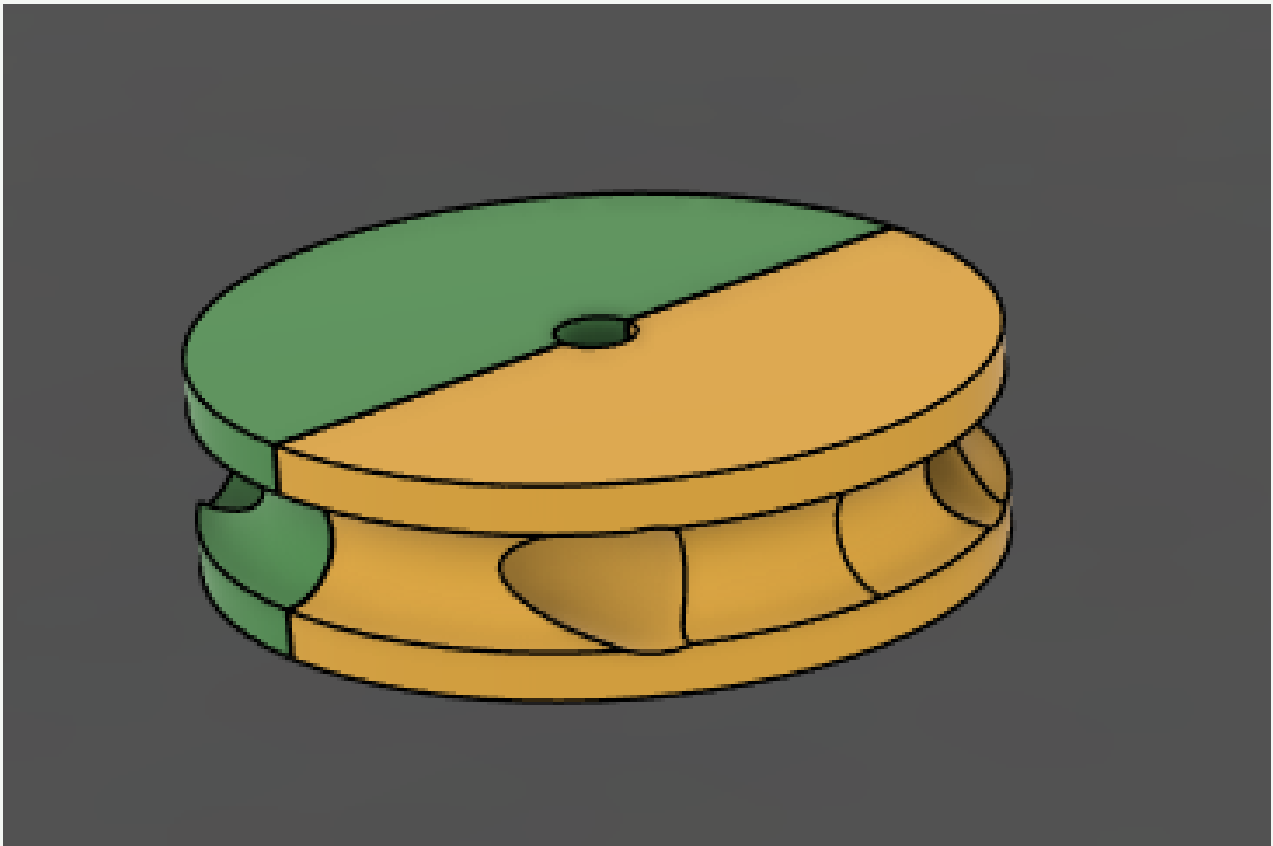


Fig. 15: Two-piece clamping axle pulley.

Note

Before operation, check that the pulley runs true, is secure and does not touch any vehicle components.

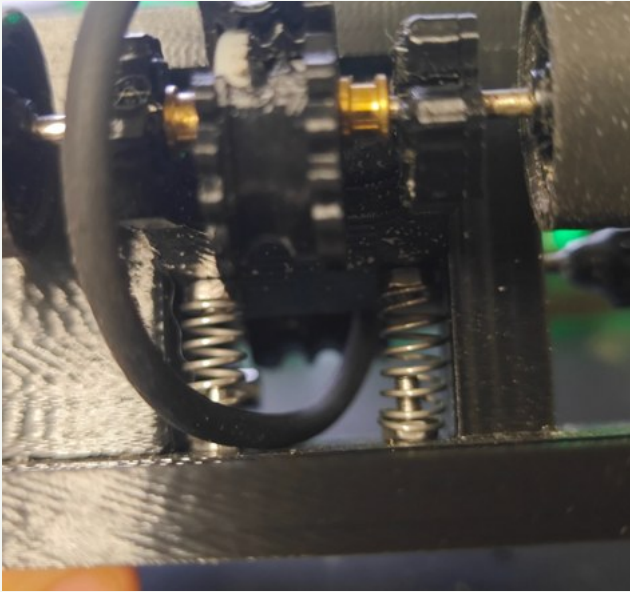
OPTIONAL IMPROVEMENTS

Springs and rubber feet

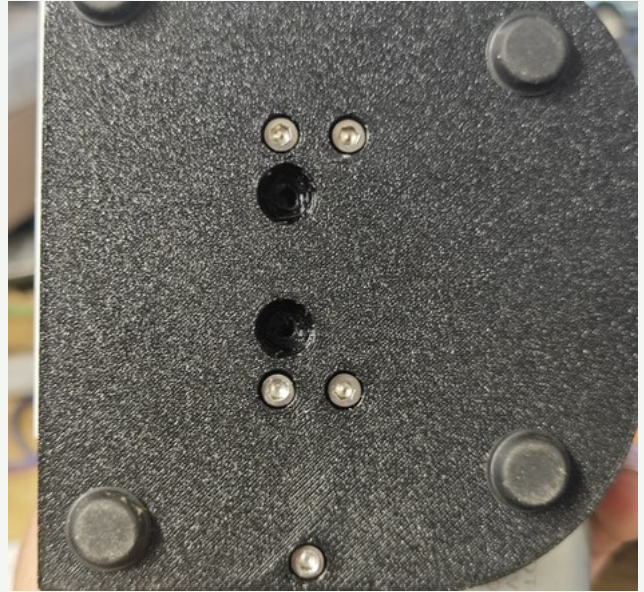
Comfort and adaptation to your setup.

Additional springs beneath the swing arm

Two small compression springs can be fitted beneath the swing arm. They are retained by screws inserted through the base from below. This addition is optional and is not required for basic operation.



Optional compression springs installed beneath the swing arm.



Underside with rubber feet.

Rubber feet

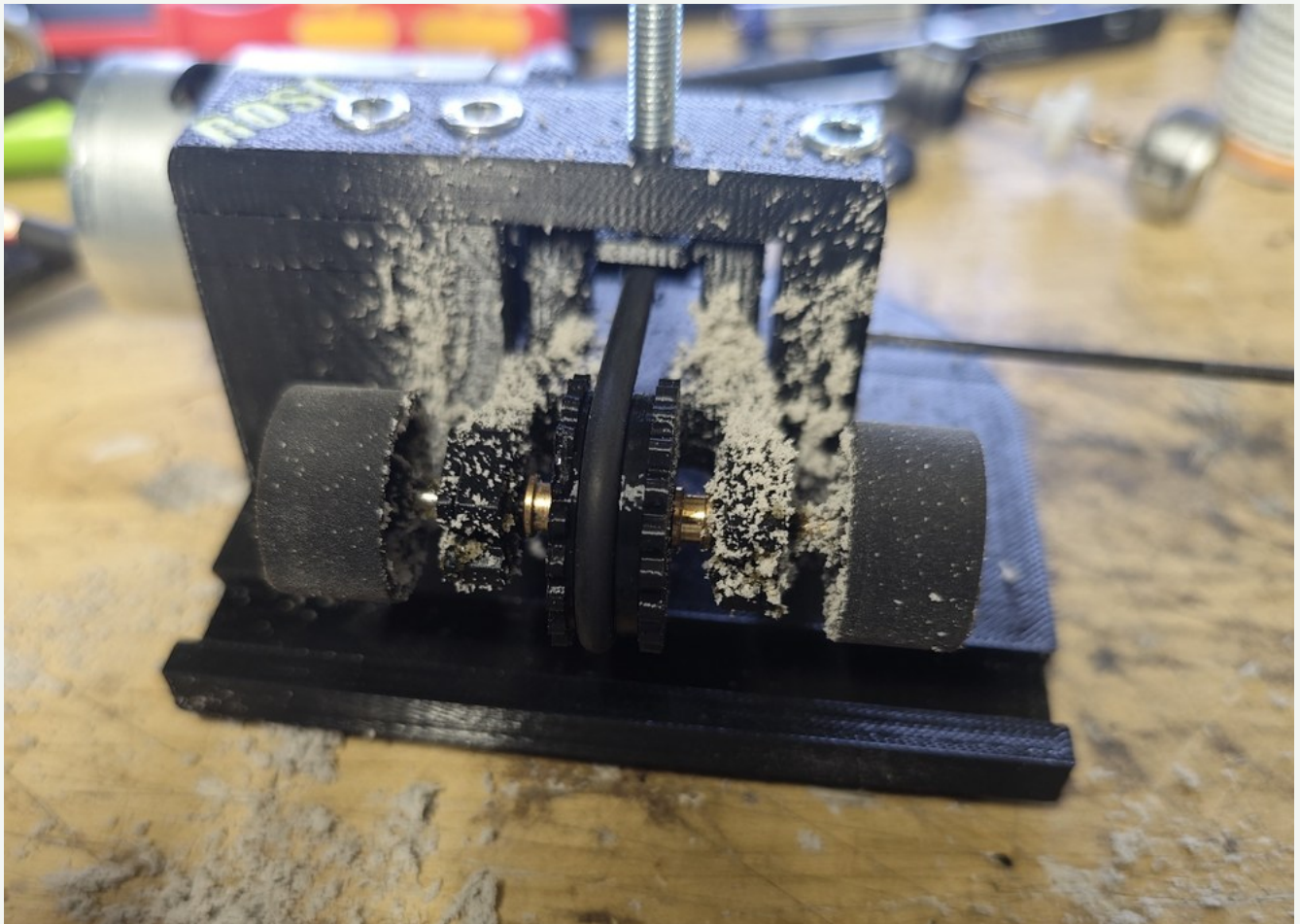
Rubber feet on the underside reduce vibration, improve stability and compensate for small irregularities in the work surface.

Final check

Before first use, retighten all screws, check that the swing arm and sanding block move freely without play, position the O-ring correctly and ensure that both pulleys are aligned.

COMPLETE

ROSI Version 1.0 is assembled

<https://rosi.i3ull3t.de>

ROSI in practical use.

Mechanical assembly is complete. Take enough time for calibration - a properly aligned unit is the basis for evenly sanded slot car tires with optimized runout.

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