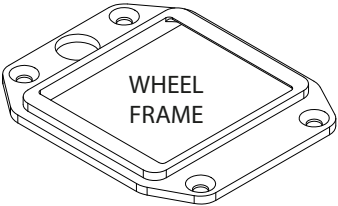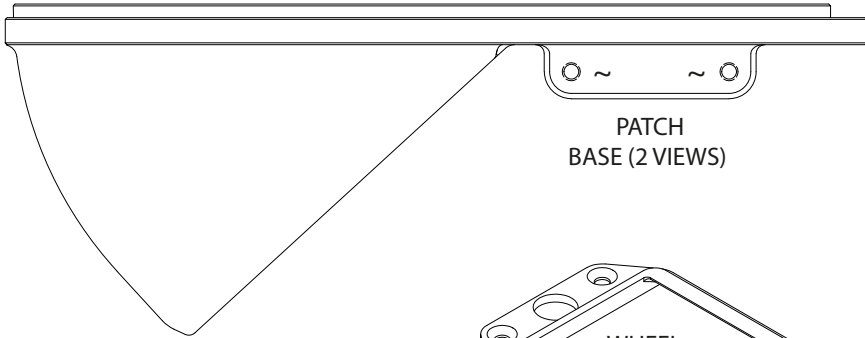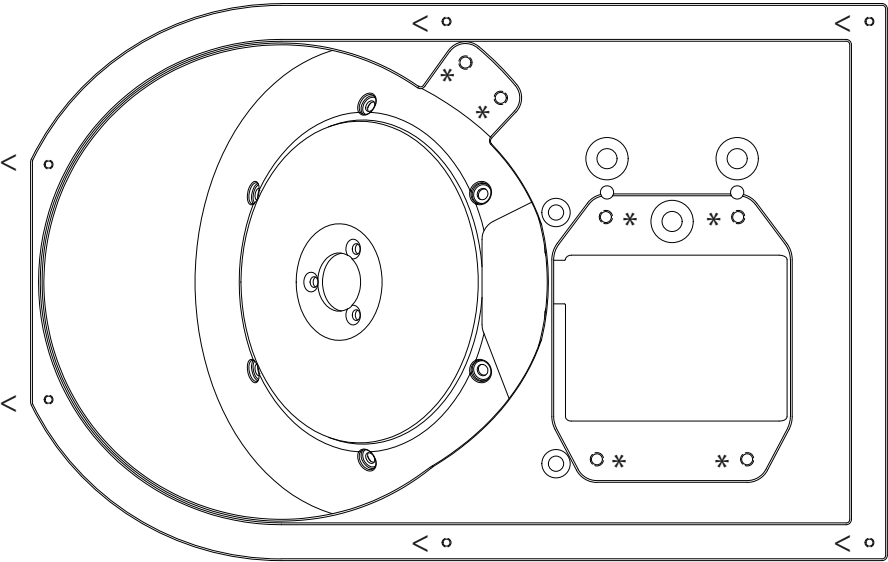# FORAGING PATCH

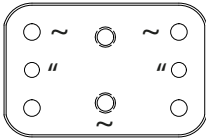## Assembly instructions

# PARTS LIST

## 3D PRINTED PARTS

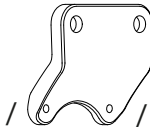WHEEL HOLDER
TOP
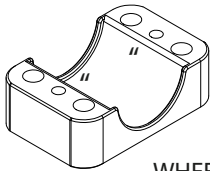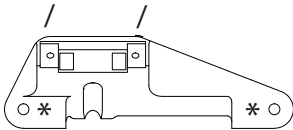
BEAM BREAK
HOLDER

WHEEL

WHEEL HOLDER BASE
(2 VIEWS)
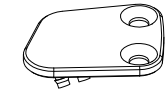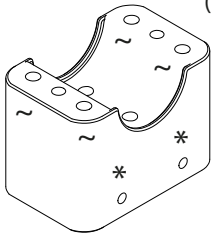
MAGNET HOLDER

PATCH
BASE (2 VIEWS)

SPACER

PELLET STOPPER

WHEEL
FRAME

MAGNETIC
ENCODER HOLDER
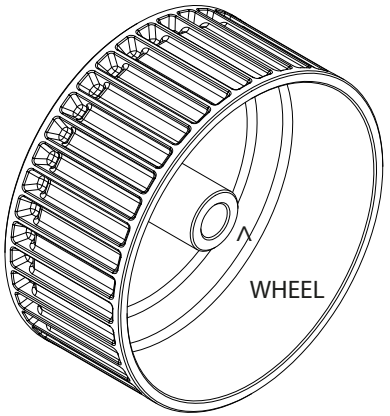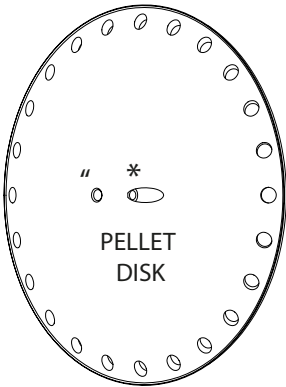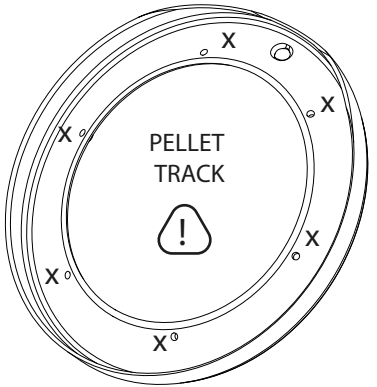
PELLET
DISK

PELLET
TRACK

| ID | Screw Type | Screw Size | Length (mm) | Quantity |
|----|-----------|-----------|-------------|----------|
| 1 | CSK | M3 | 8 | 4 |
| 2 | CSK | M2 | 5 | 3 |
| 3 | CSK | M2 | 8/10 | 6 |
| 4 | CSK | M3 | 6 | 6 |
| 5 | CSK | M2.5 | 4 | 6 |
| 6 | CSK | M4 | 10 | 2 |
| 7 | CAP | M2 | 6 | 2 |
| 8 | CSK | M3 | 30 | 4 |
| 9 | CAP | M4 | 20 | 4 |
| 10 | GRUB | M3 | 10 | 1 |
| 11 | CSK | M4 | 12 | 3 |
| 12 | CAP | M2 | 4 | 2 |
| 13 | PINS | M3 | 12 | 2 |

< M2 brass insert

" M3 rim

∧ M8 rim

/ M2 tap

X M2.5 tap

∗ M3 tap

~ M4 tap

⚠ FRAGILE



ELECTRONIC BOX

ELECTRONIC BOX LID
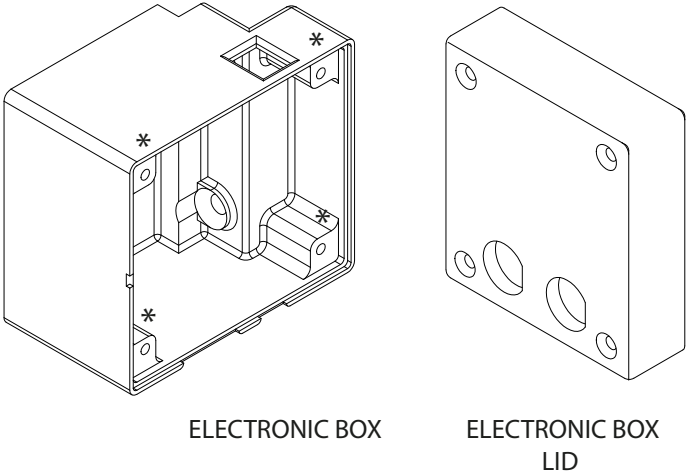
MISCELLANEOUS

ELECTRONICS



NEODYMIUM MAGNET

TUBE X 2

SHOULDER BOLT M6

LOCK NUT M6

WASHER M6

BEARINGS

MAGNETIC ENCODER

RASPBERRY PI PICO

MOTOR

BEAM BREAK

PATCH ELECTRONICS

METAL HEX TILE
2mm
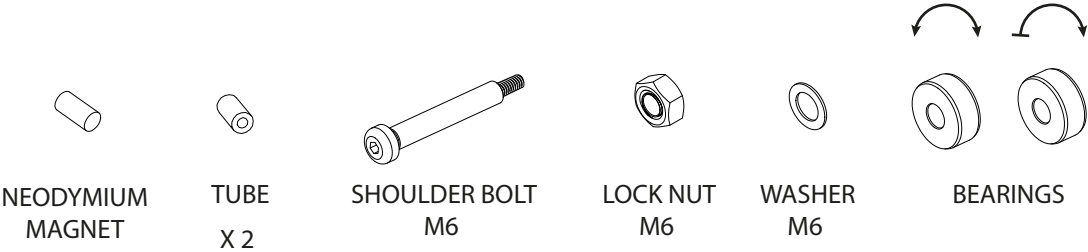
FORAGING PATCH TILE
3mm
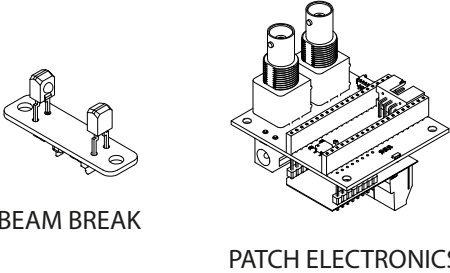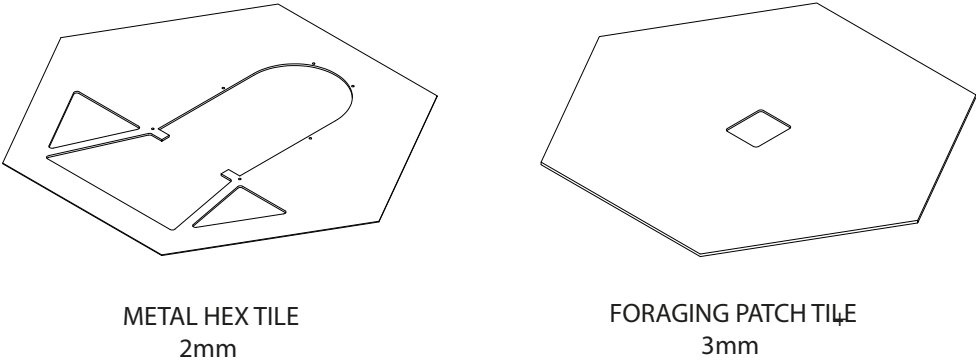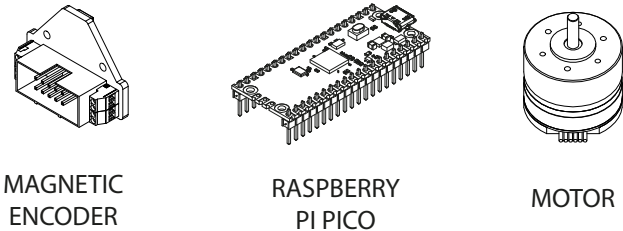
+ White matt 3mm

1. Create a flat surface on the motor shaft by filing it or using a handheld dremel.

FILE

2. Rotate the foraging patch base and insert the motor. Screw the motor in place from the front using three screws (ID 2).

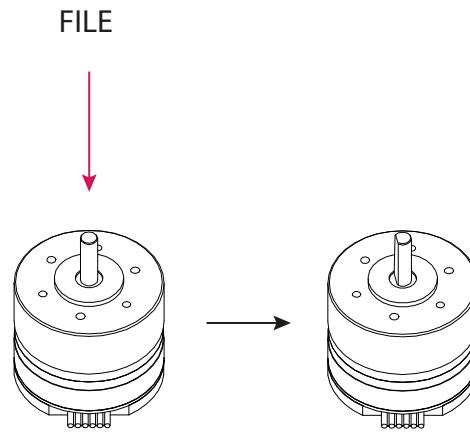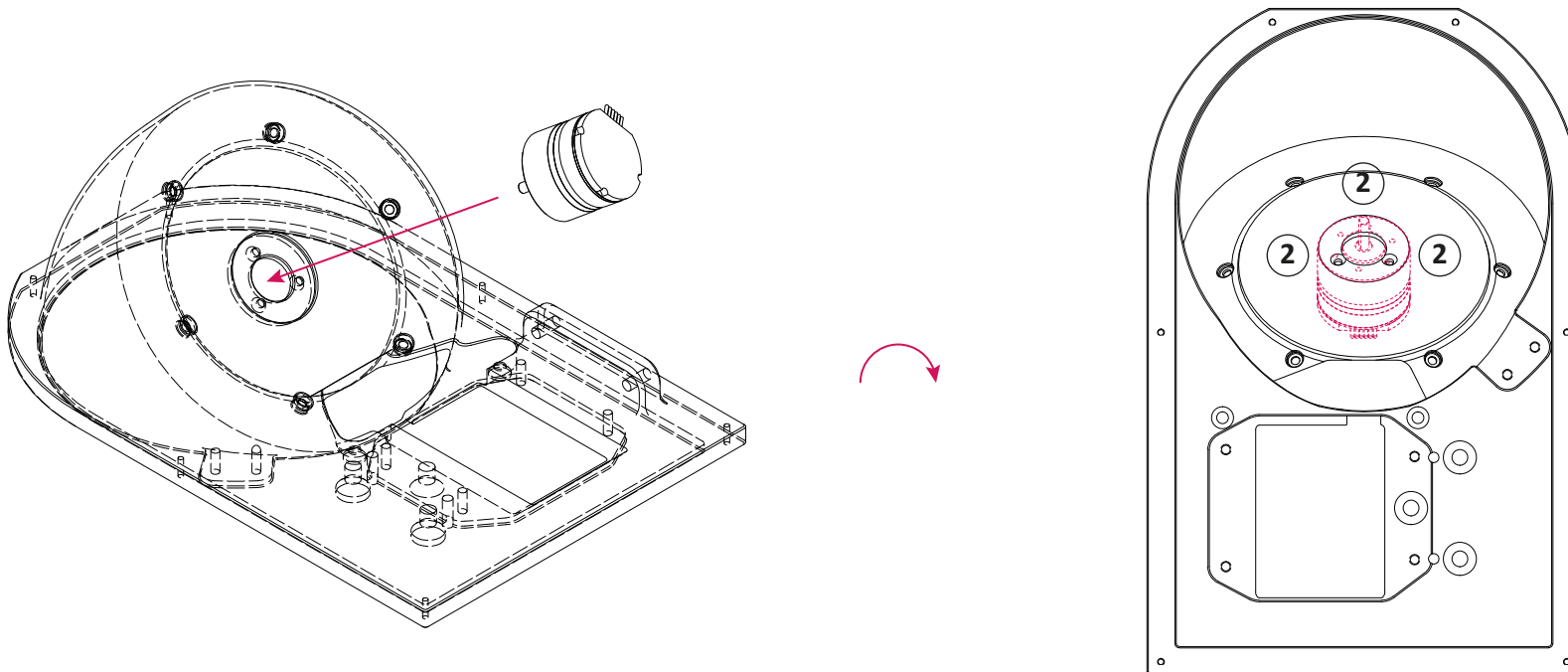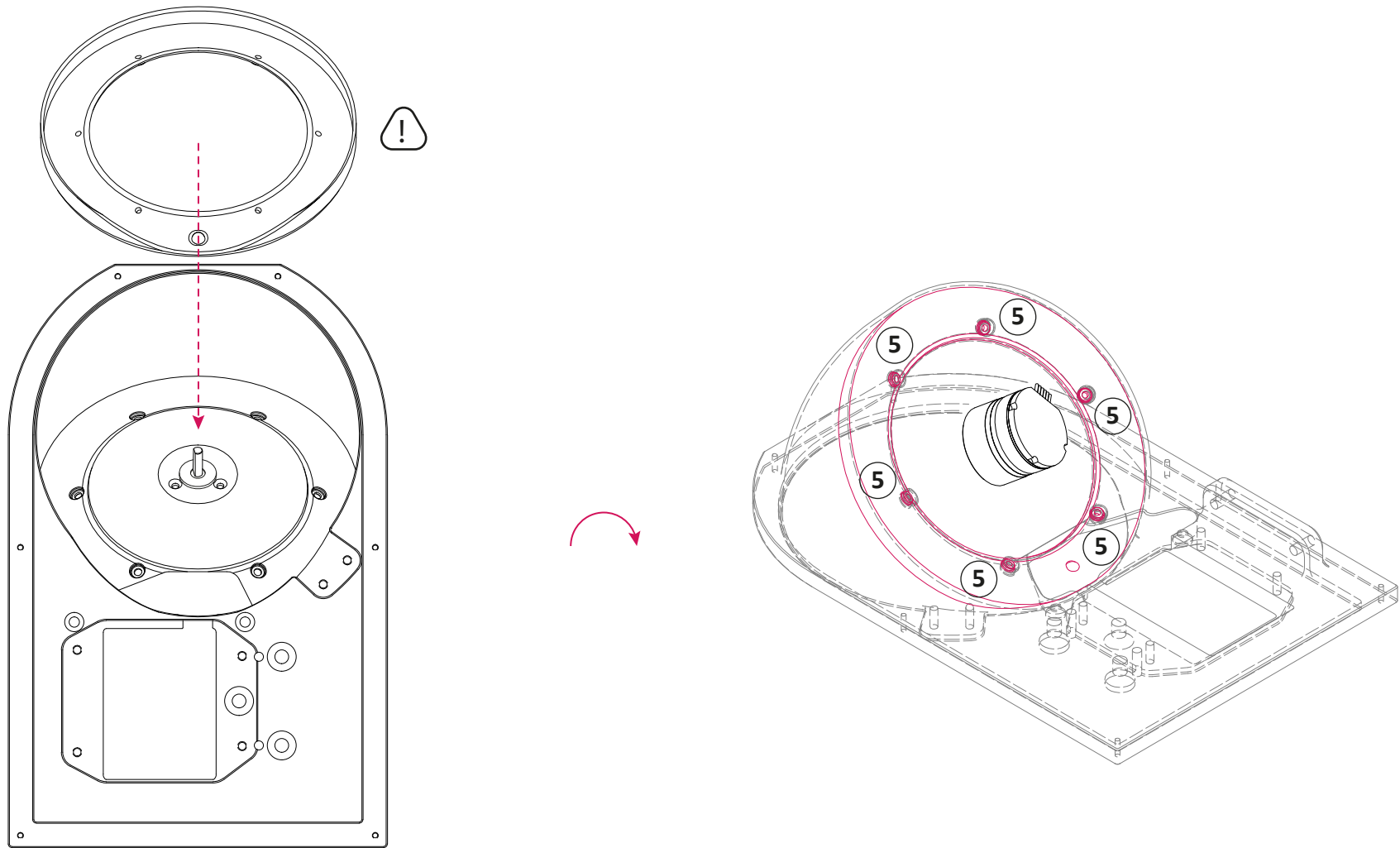**3.** Carefully handle the track and gently insert it in the foraging patch making sure of aligning the holes. Rotate the base and hold the track in place by using six screws (ID 5).

4. Lower the disk into the patch base making sure to orient the grub screw tapped hole toward the flat surface previously created on the motor metal pin (see step 1). Push down the disk until the top of the pin is flushed to the disk itself and use a grub screw (ID 10) to hold the disk in place. Make sure the grub screw touches the flat surface of the trimmed motor pin.
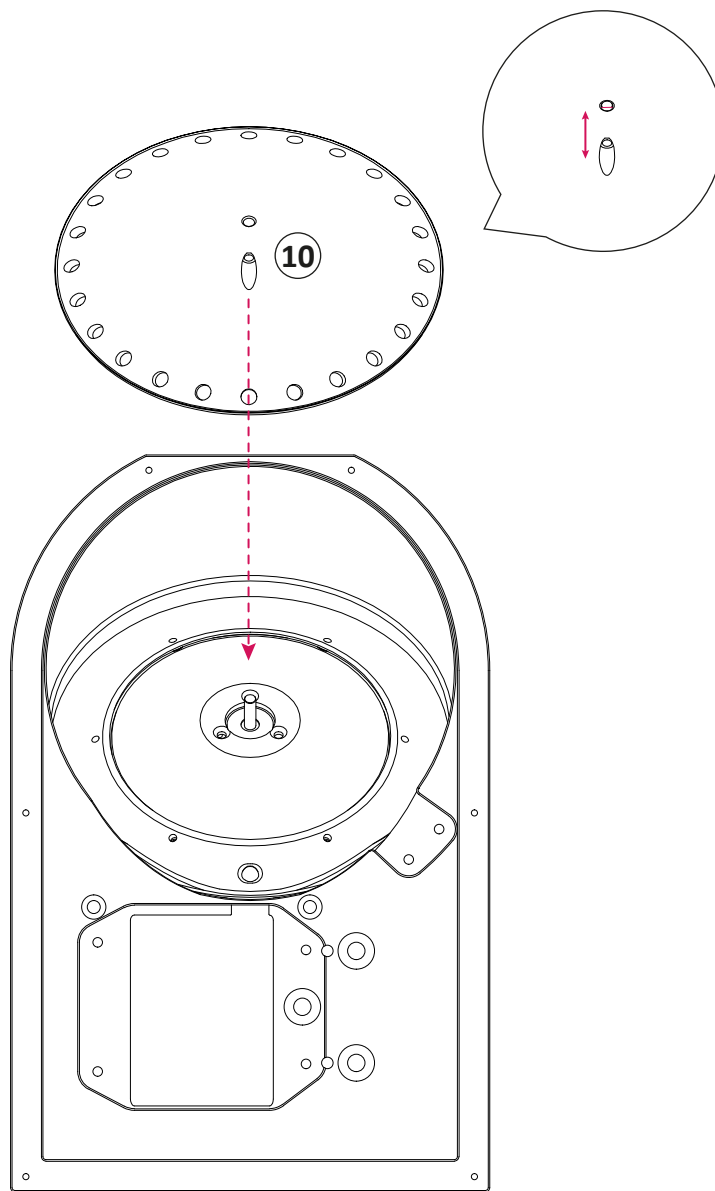
**5.** Insert two short silicon tubes in each pellet stopper pin and screw it in place with two screws (ID 4).
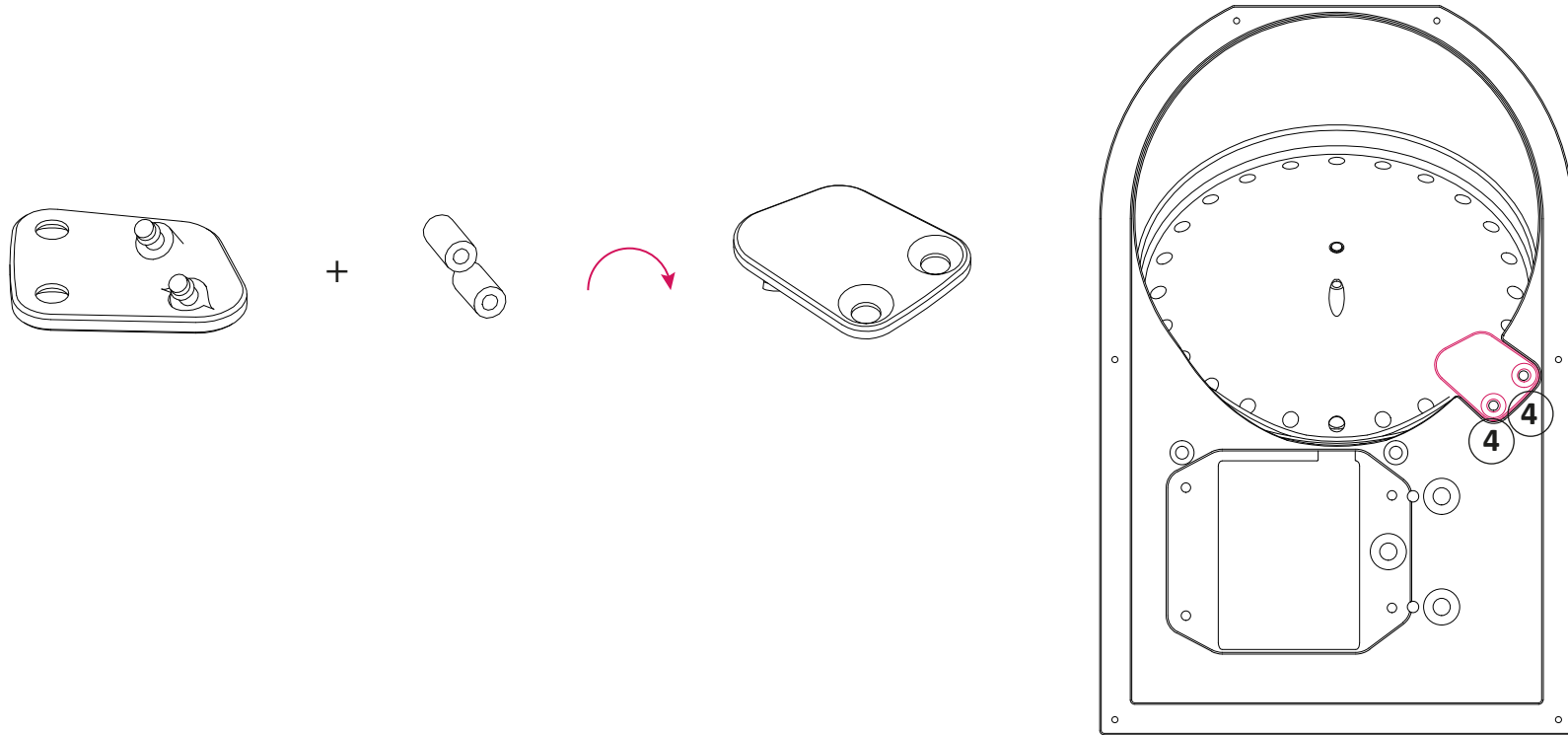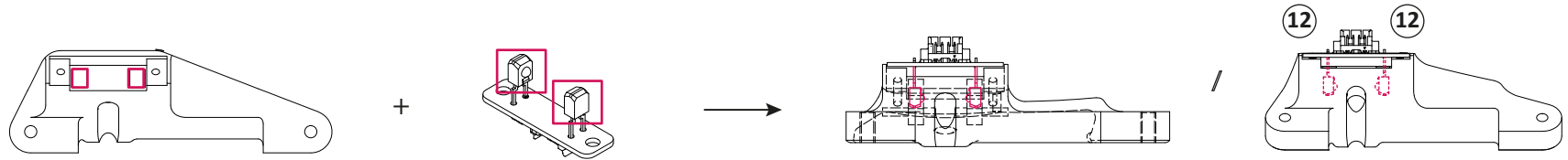
6. Place the wheel frame on the patch base with 4 screws (ID 4).
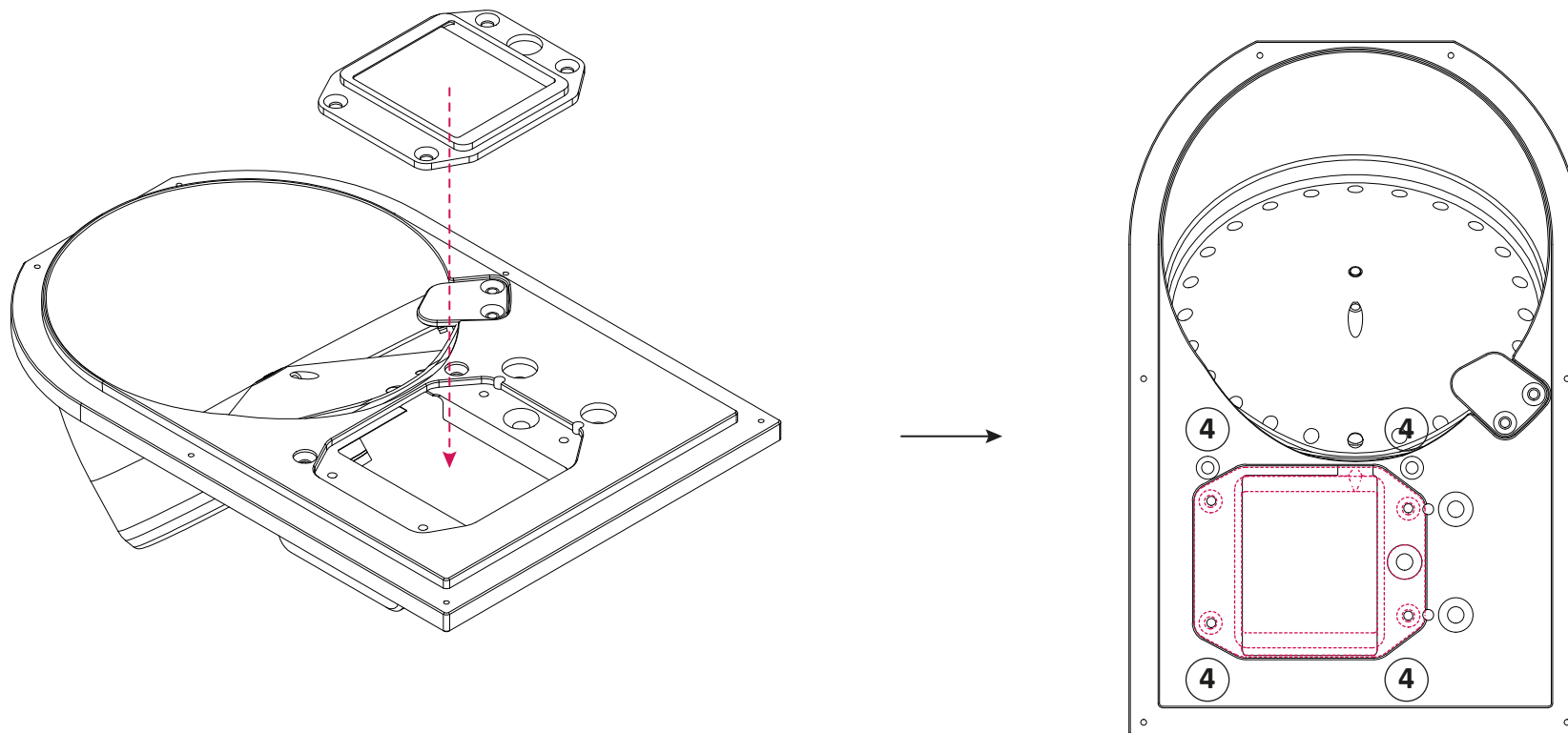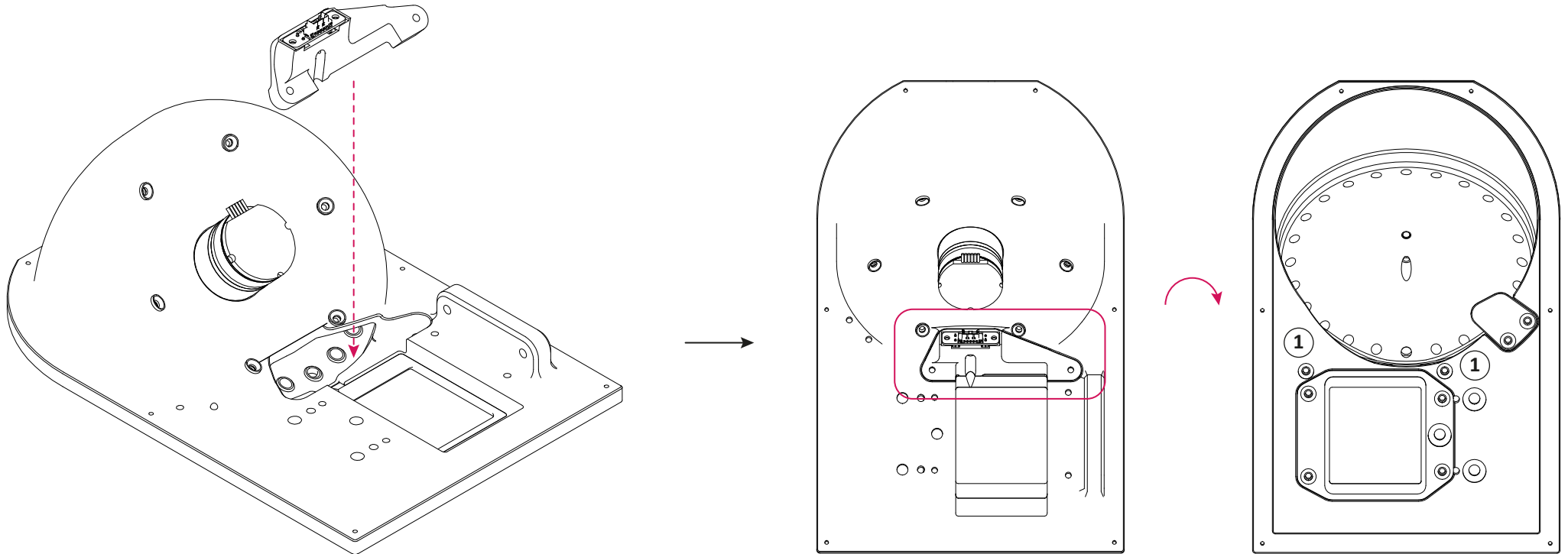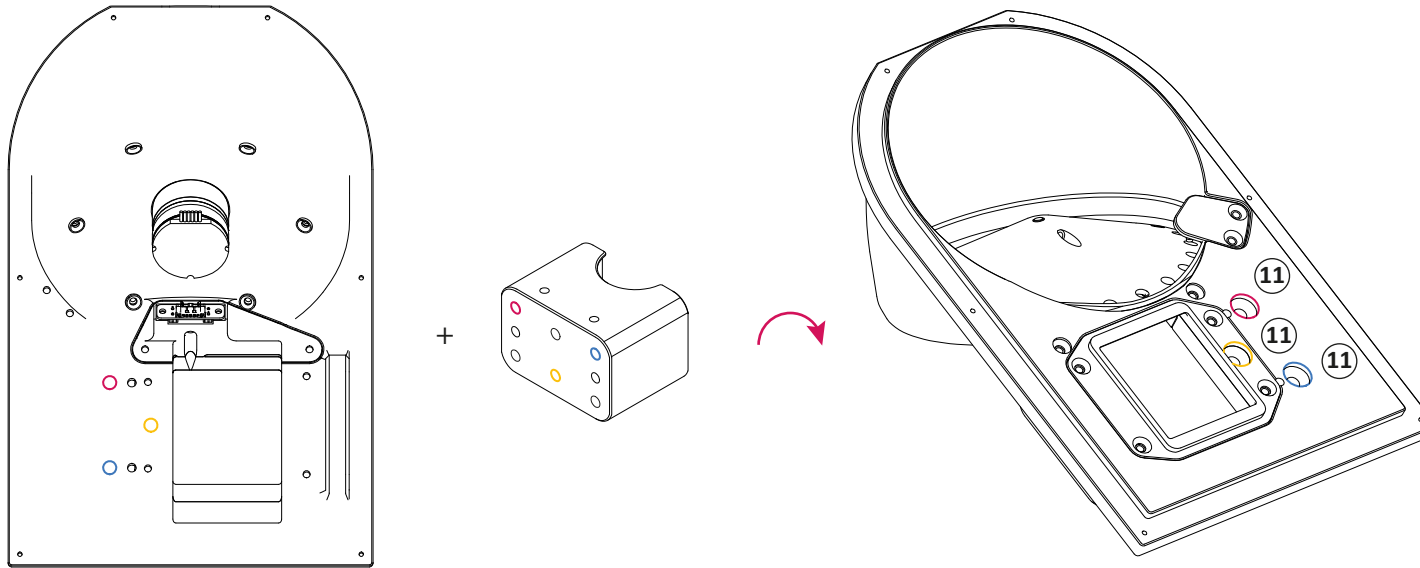
7. Carefully insert the beam break PCB board into the beam break holder (ID 12).
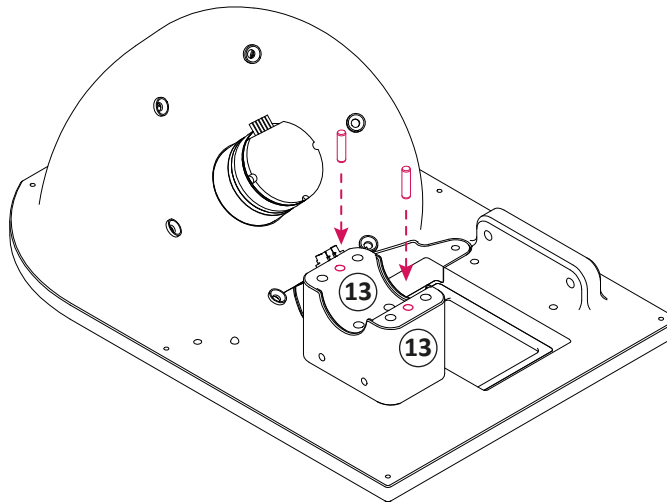


8. Slot the beam break holder in the back of the patch base and screw it in place from the front (ID 1).
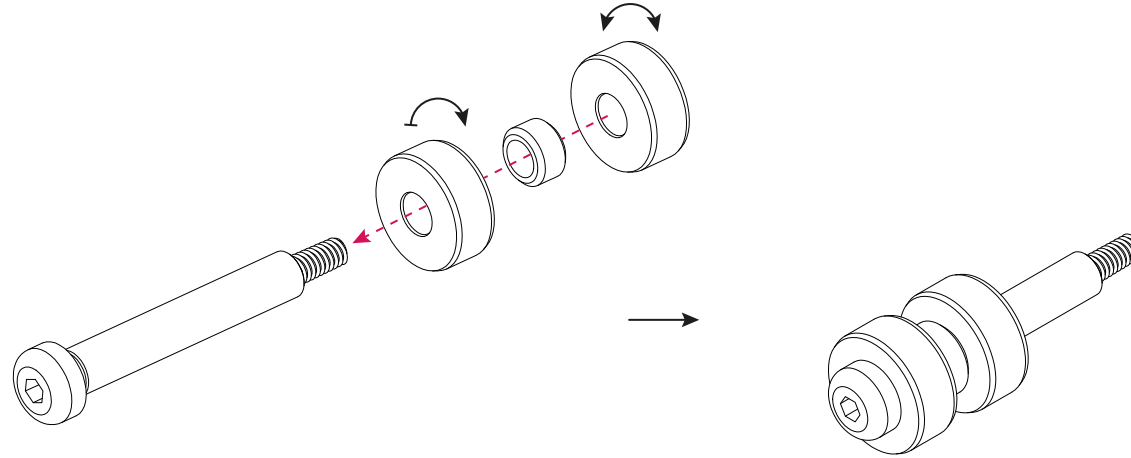
**9.** Hold the wheel holder base on the back of the patch base and screw it in place with 3 screws (ID 11).



**10.** Insert two parallel pin (ID 13) in the middle holes. If needed, enlarge the holes using a sharp reamer.

**11.** Slide the one way bearing, the spacer and the two way bearing onto the shoulder bolt.

**12.** Insert the shoulder bolt into the wheel hole and tighten it in place using a lock nut. If needed, enlarge the hole using a reamer. Holding the shoulder bolt, insert the magnet holder on the cap and put the neodymium magnet into place (the magnet would hold its position).
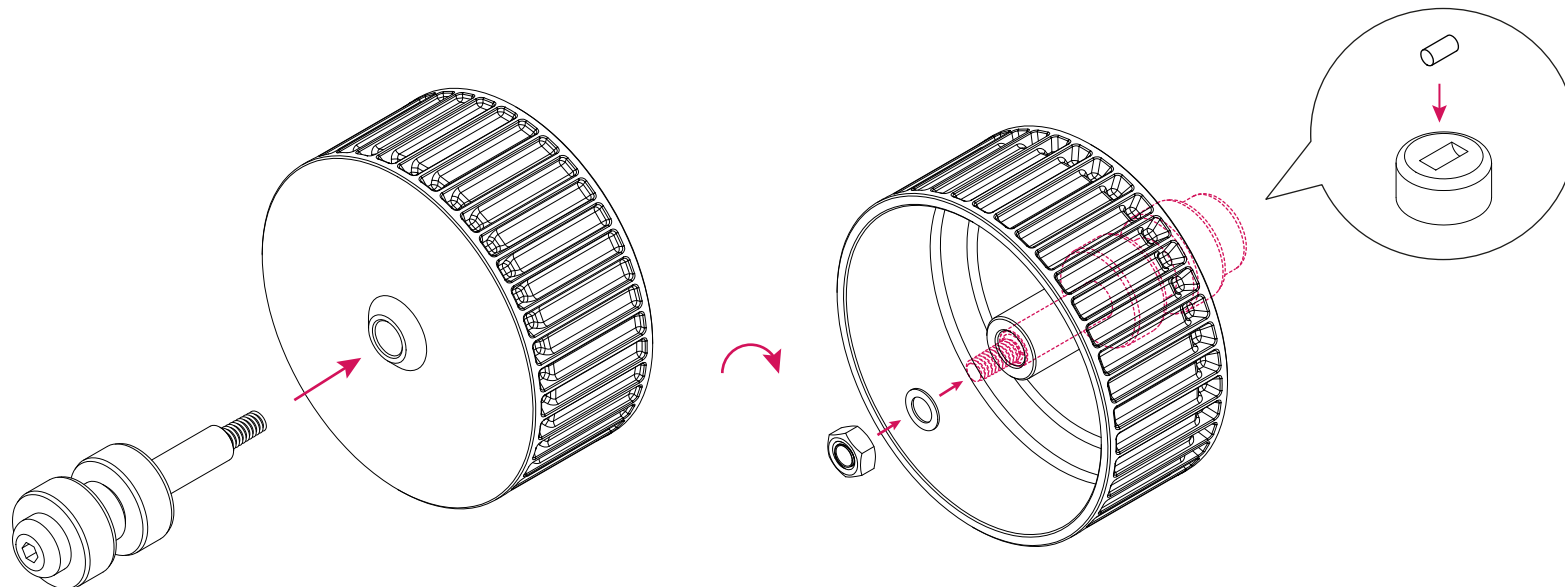
**13.** Rotate the foraging patch on its back and place the shoulder bolt with the bearings onto the wheel holder base. The wheel should sit withing the patch base opening (blue).
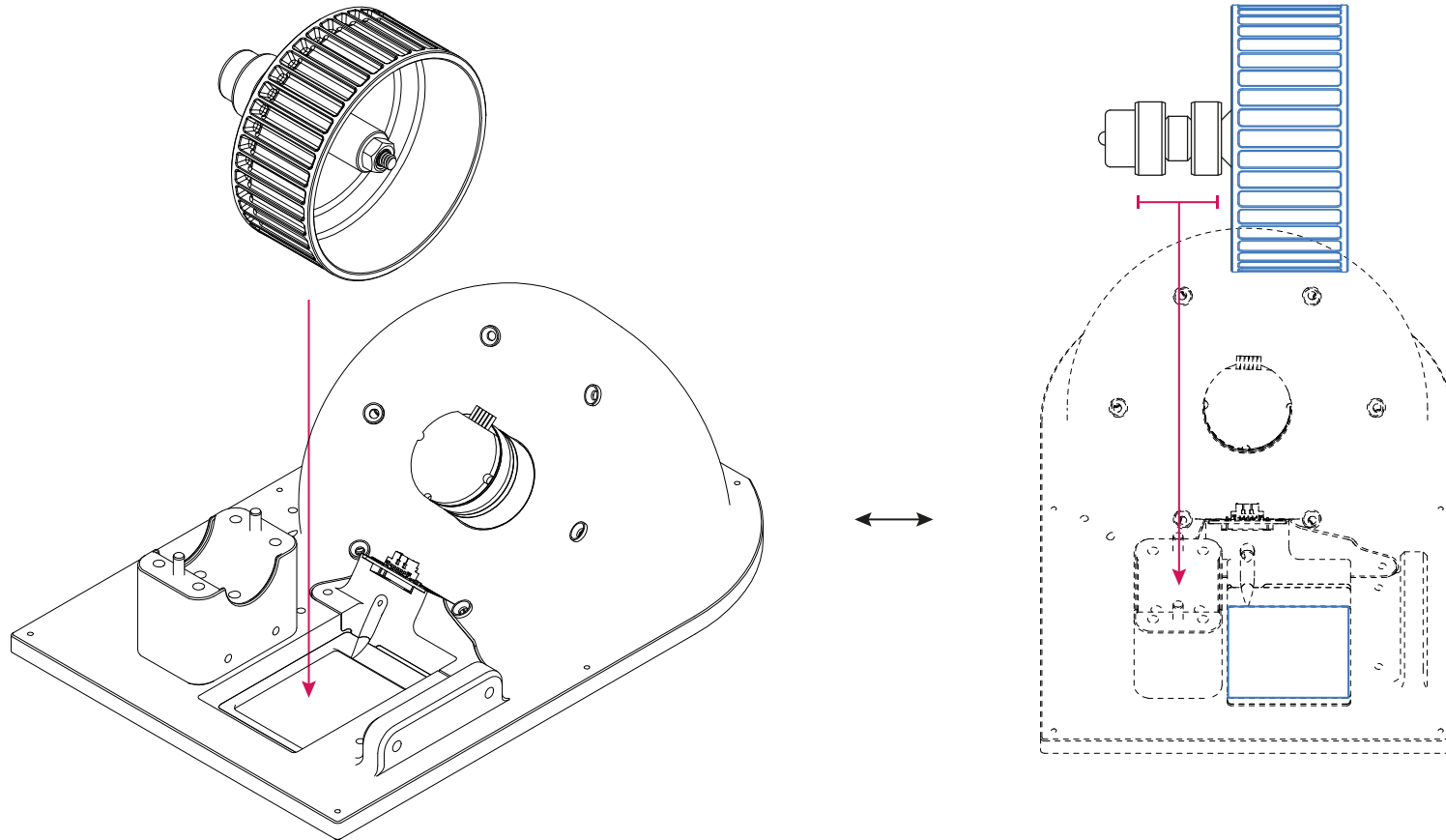
**14.** Lower the wheel holder top onto the bearing and insert the pins. Carefully align the holder base and top using the pins as well as 4 screws (ID 9). The aim is to obtain an equally spaced gap between the wheel holder base and the top.
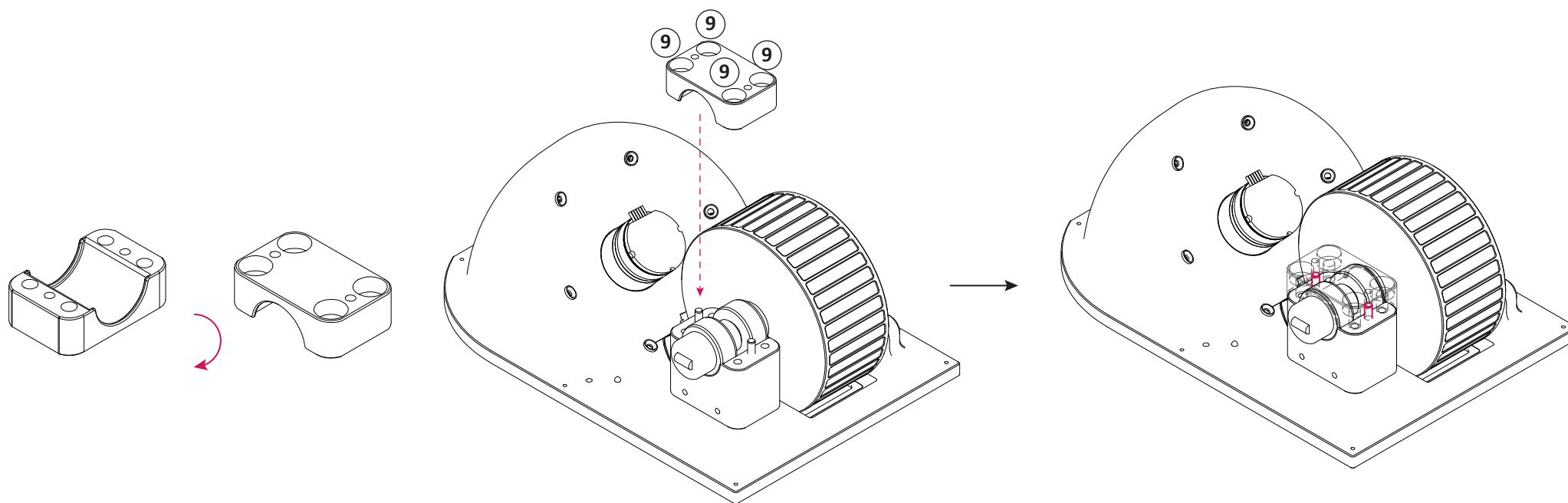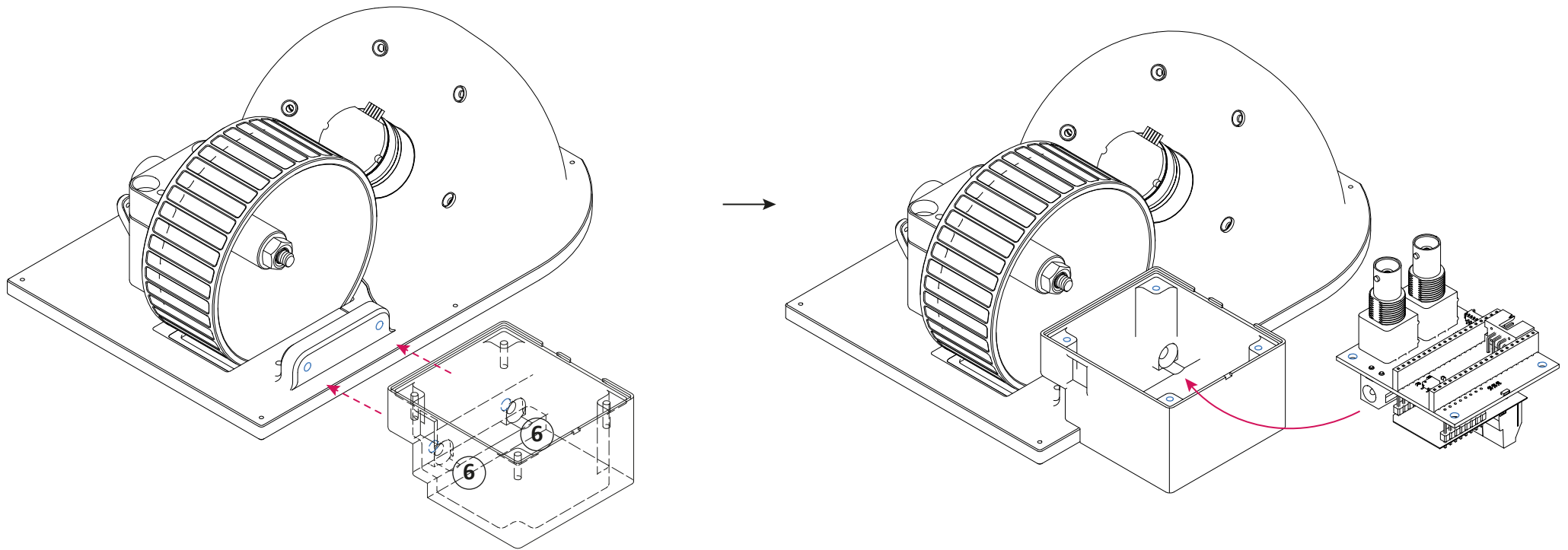
**15.** Screw the magnetic encoder holder into place (ID 1).
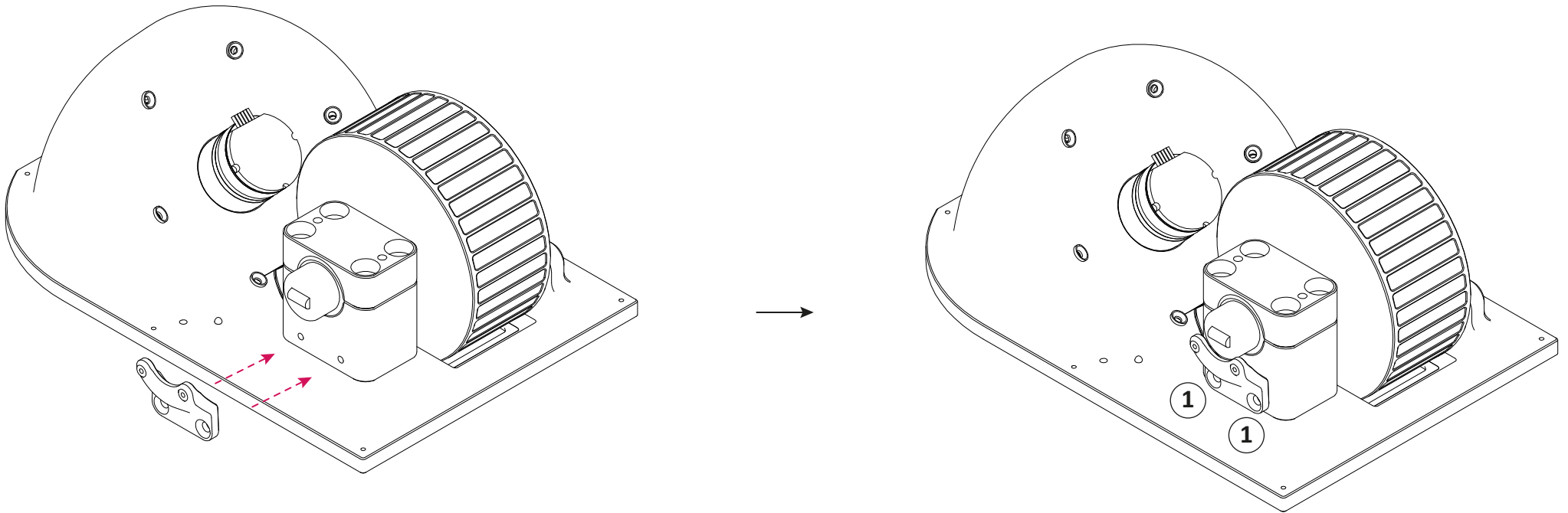
**16.** Gently place the magnetic encoder onto its holder (ID 7). The magnet should face the magnetic encoder chip.
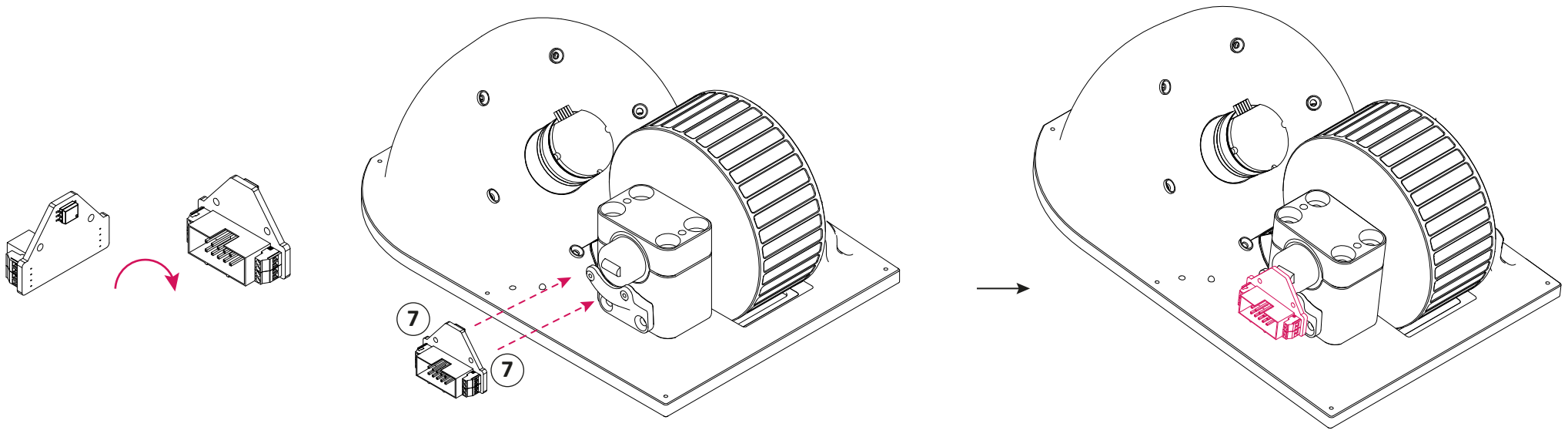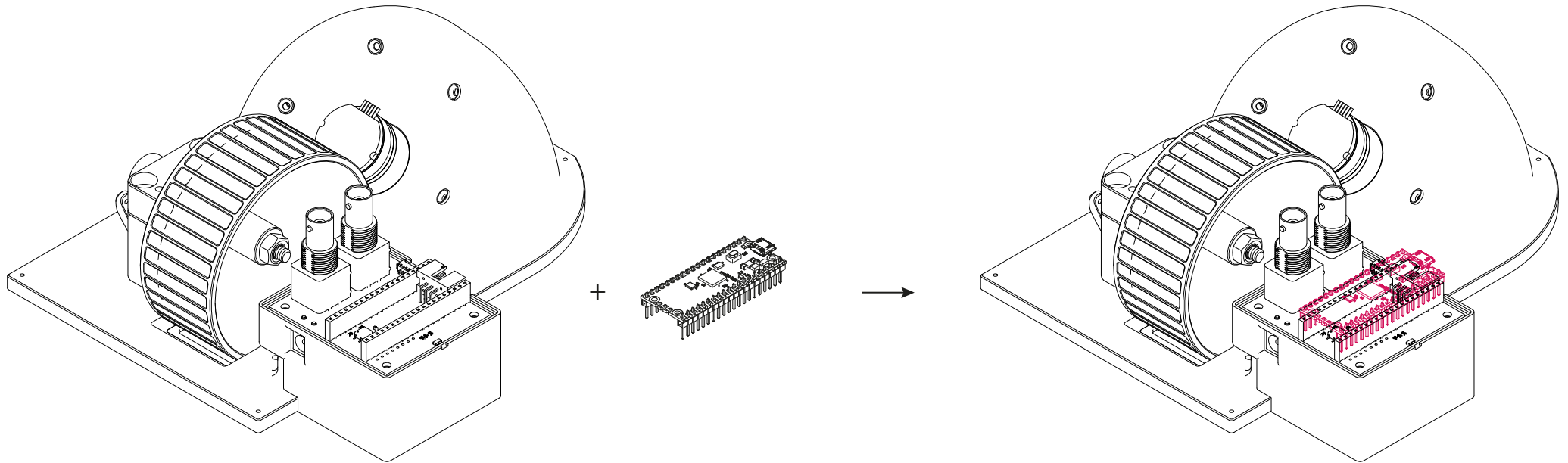
**17.** Screw the electronic box on the side of the foraging patch base (ID 6) and insert the electronics. The screws need to be inserted from the inside of the box itself.
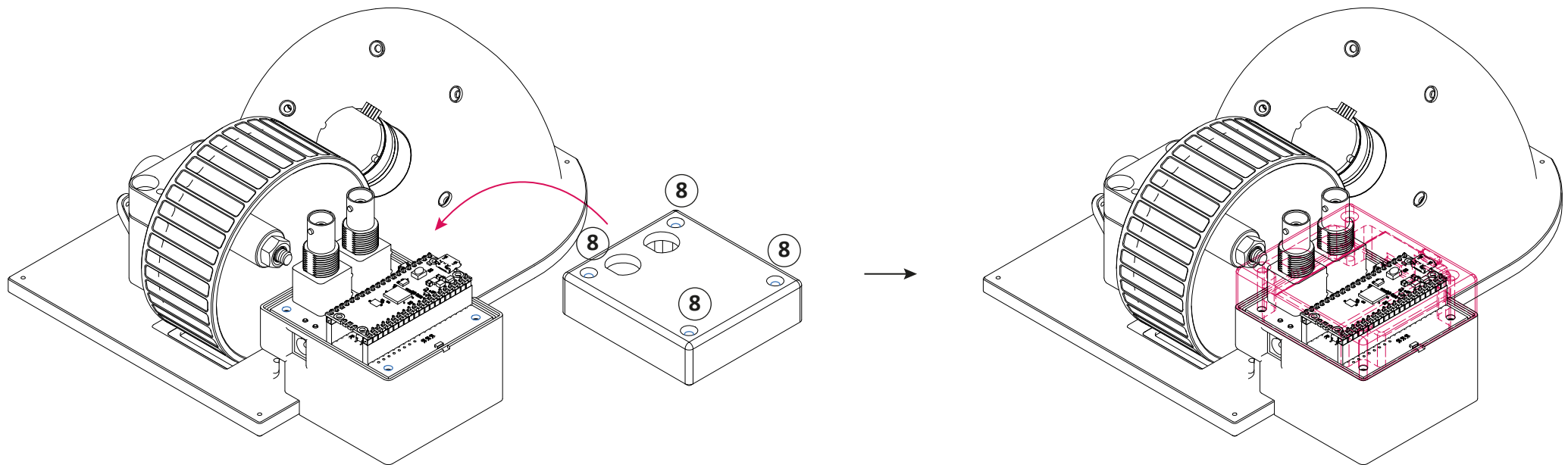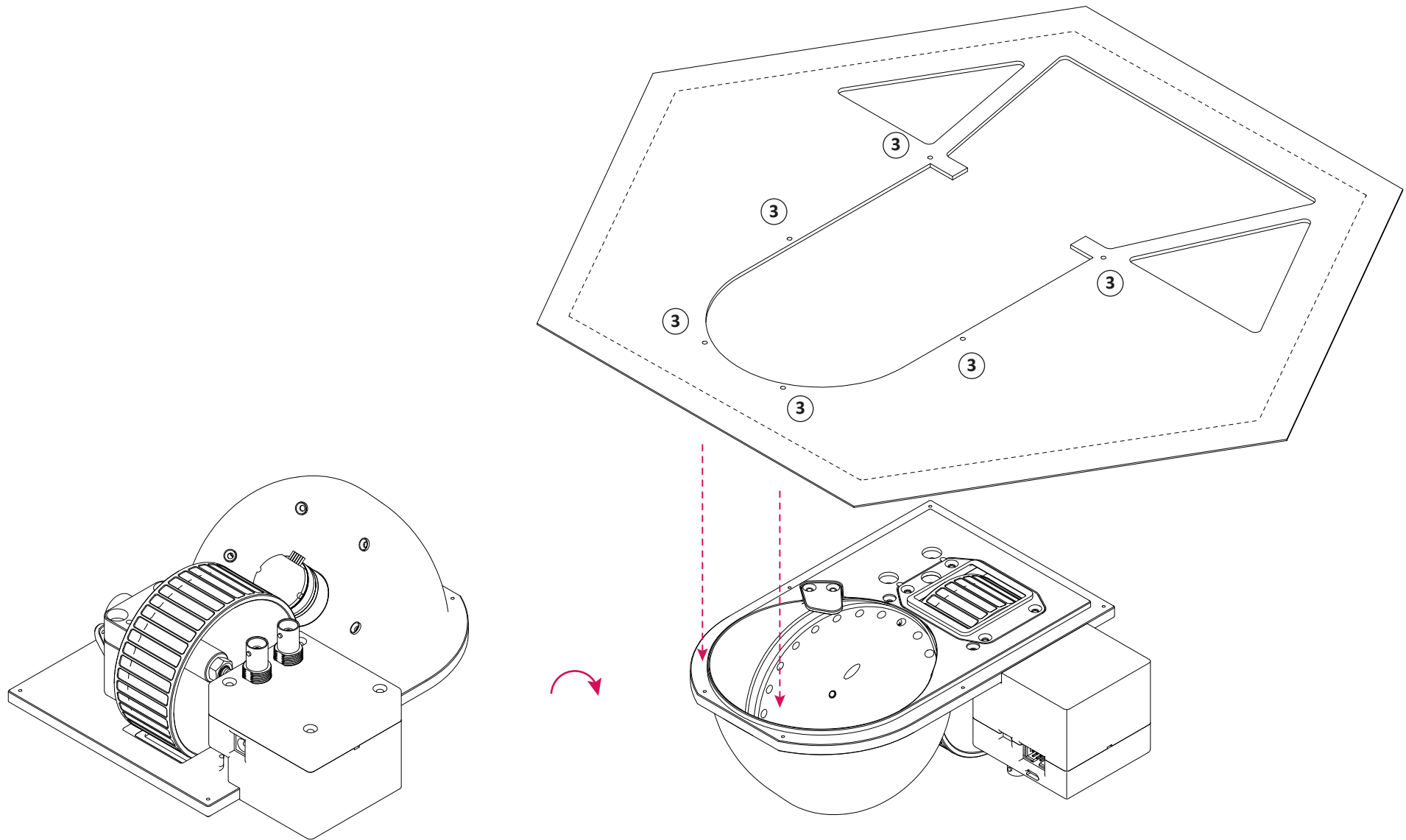
**18.** Add the Raspberry Pi Pico to the electronics.

**19.** Close the box with the electronics box lid (ID 8).

**20.** Attach the assembled foraging patch to the metal hexagon tile using 6 screws (ID 3).

NOTE: make a 1.25mm thick and 18mm wide rim all around the bottom of the metal hex tile using a milling machine.

**21.** Add the tile orienting its engraving with the foraging patch. Metal tile and patch tile should be flush with each other and only the wheel exposed.