

A close-up, high-angle photograph of the right edge of a white smartphone. The phone is oriented vertically. A silver volume button is visible, with a small black trackball integrated into its design. The background is a soft, out-of-focus light beige color.

Andreas Bülhoff
HOW TO FIX TECHNOLOGY

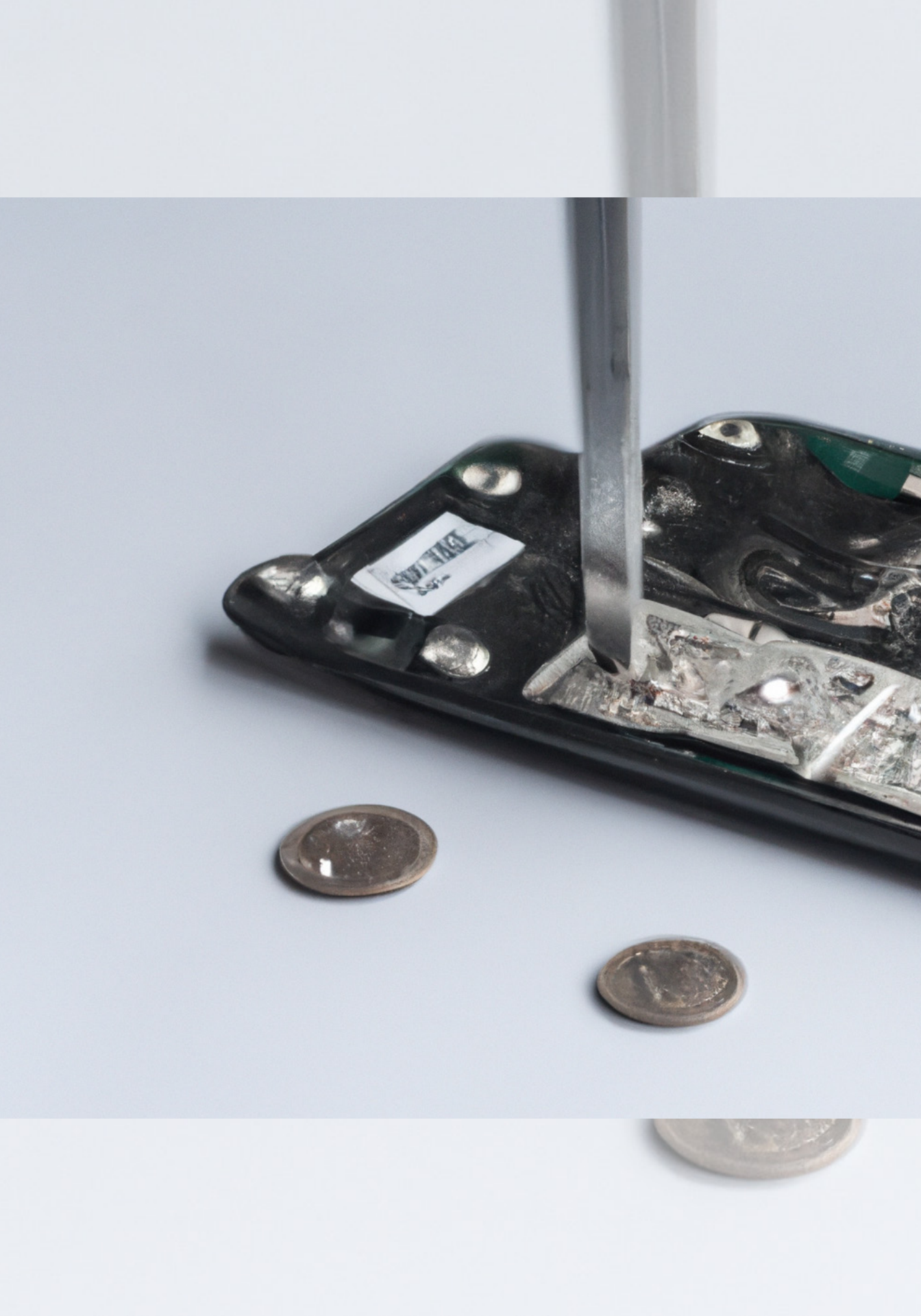
Use this guide to fix technology.



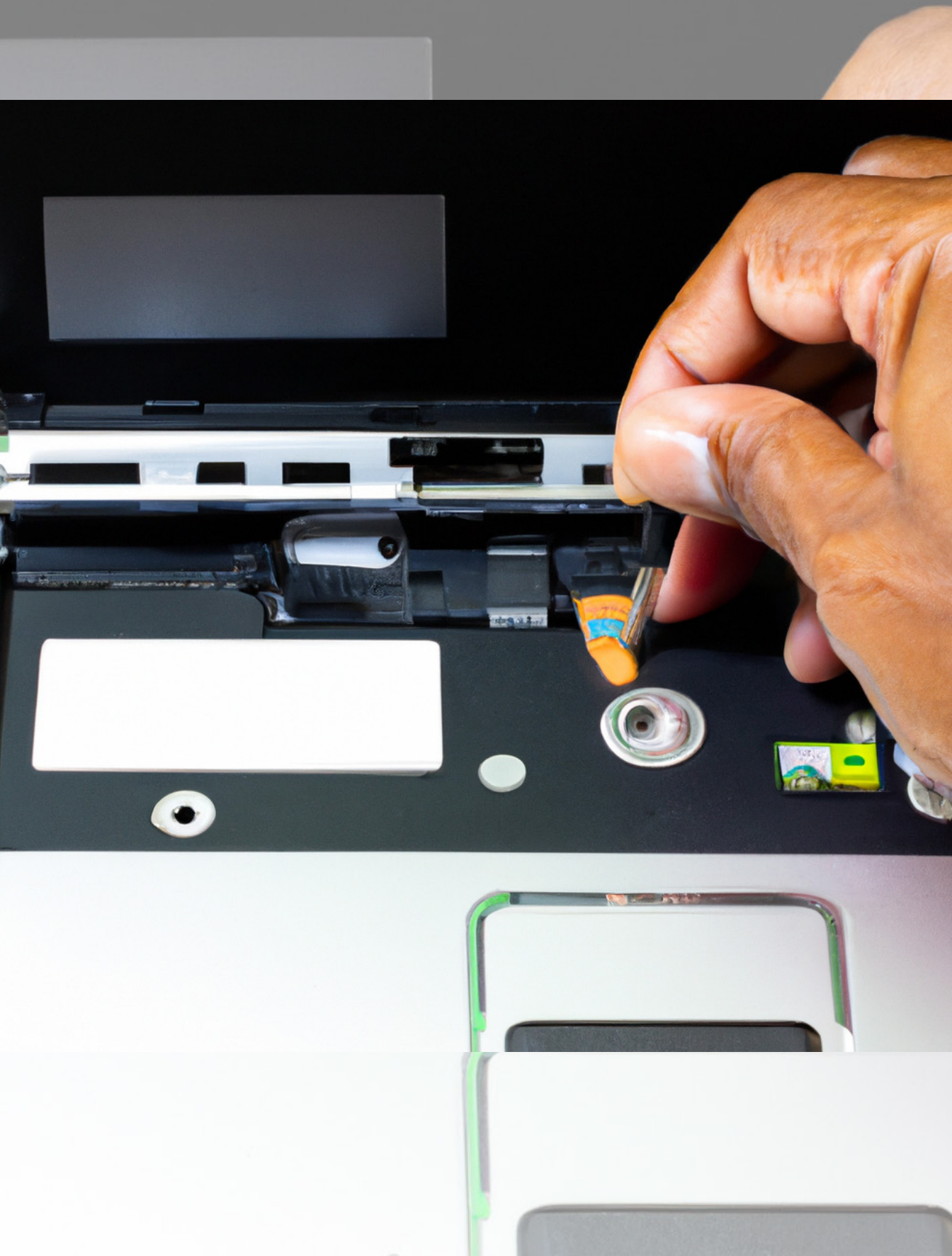
First, set the computer aside.



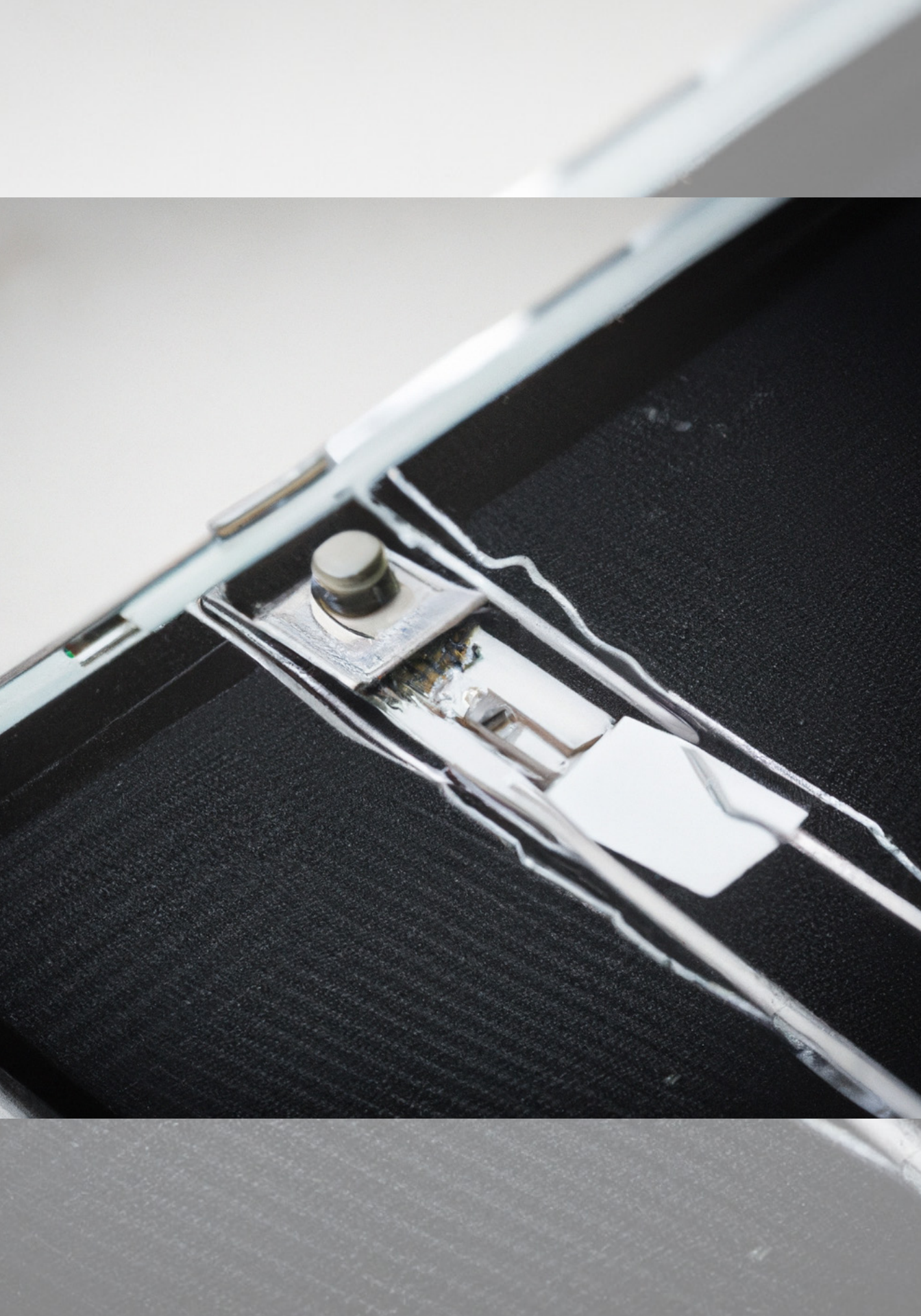
Use your fingers to unlock the battery from the side using the keyboard.



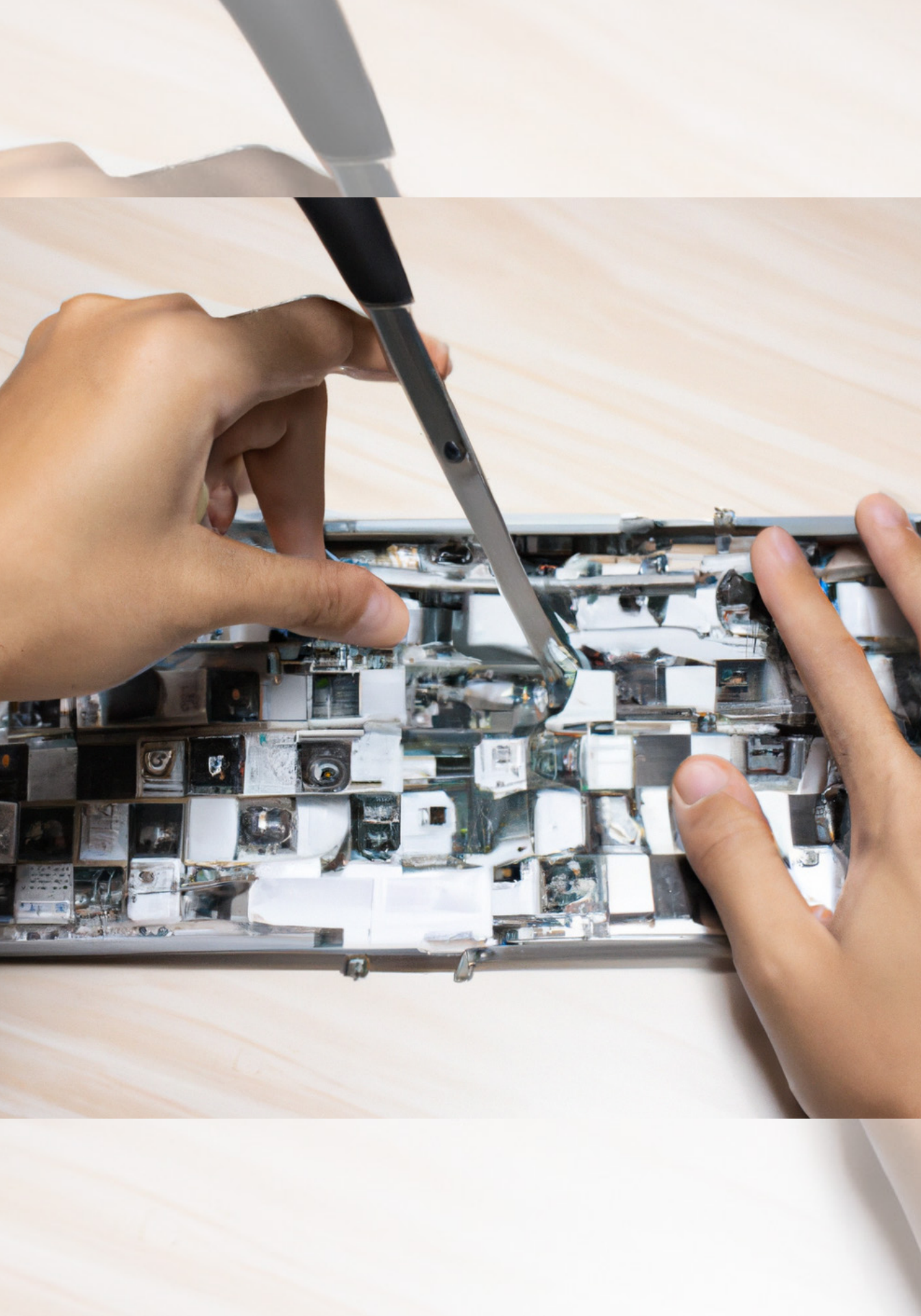
Use a coin to turn the battery locking screw 90 degrees clockwise.



**Lift the battery out of the
computer.**



Close the screen.



Grab the keyboard with both hands and toss it back while lifting the keyboard from the screen.



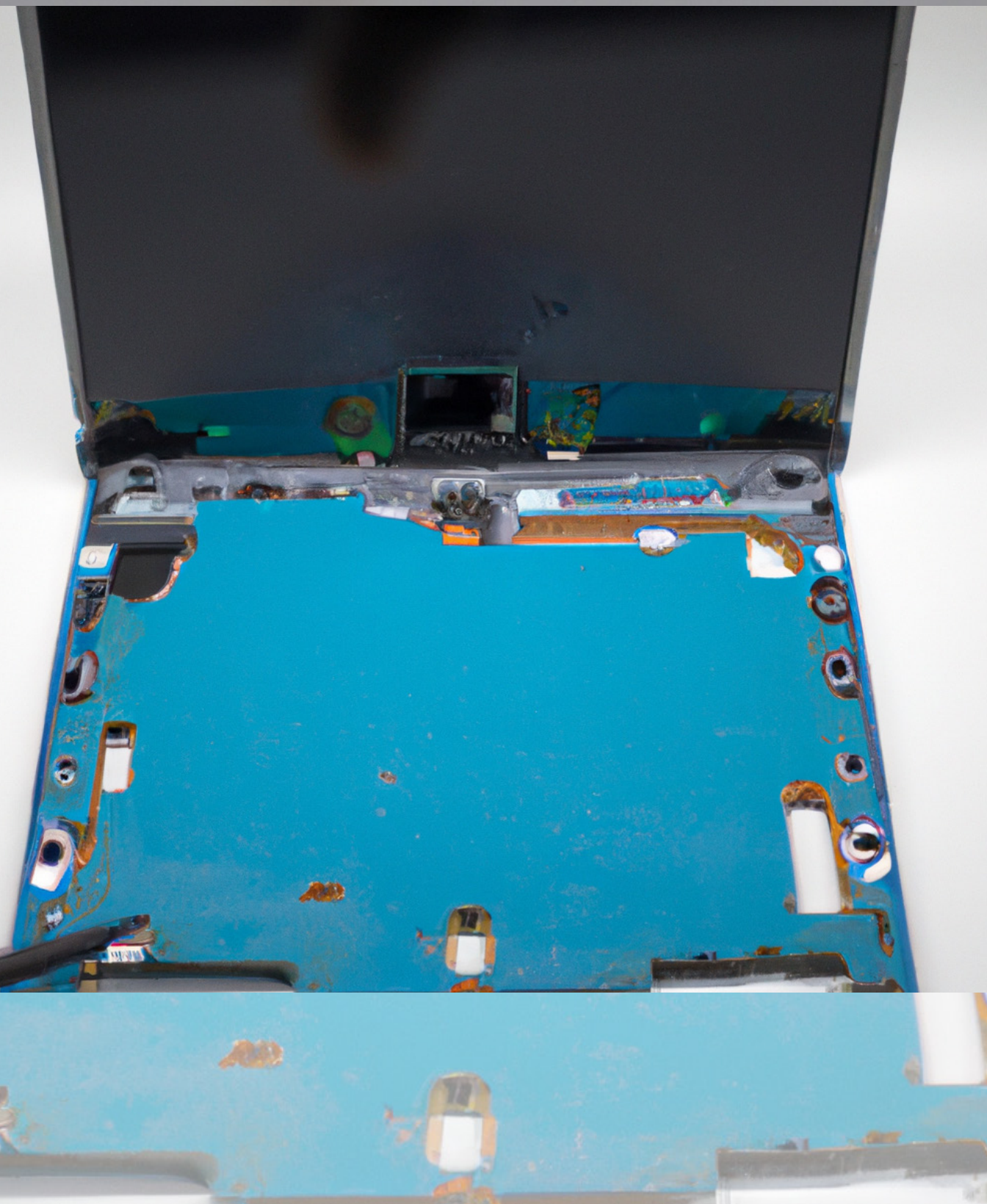
Keep the screen disconnected from the usb port by flipping it over.



The screen must be flipped over for the USB port to pop out of place.



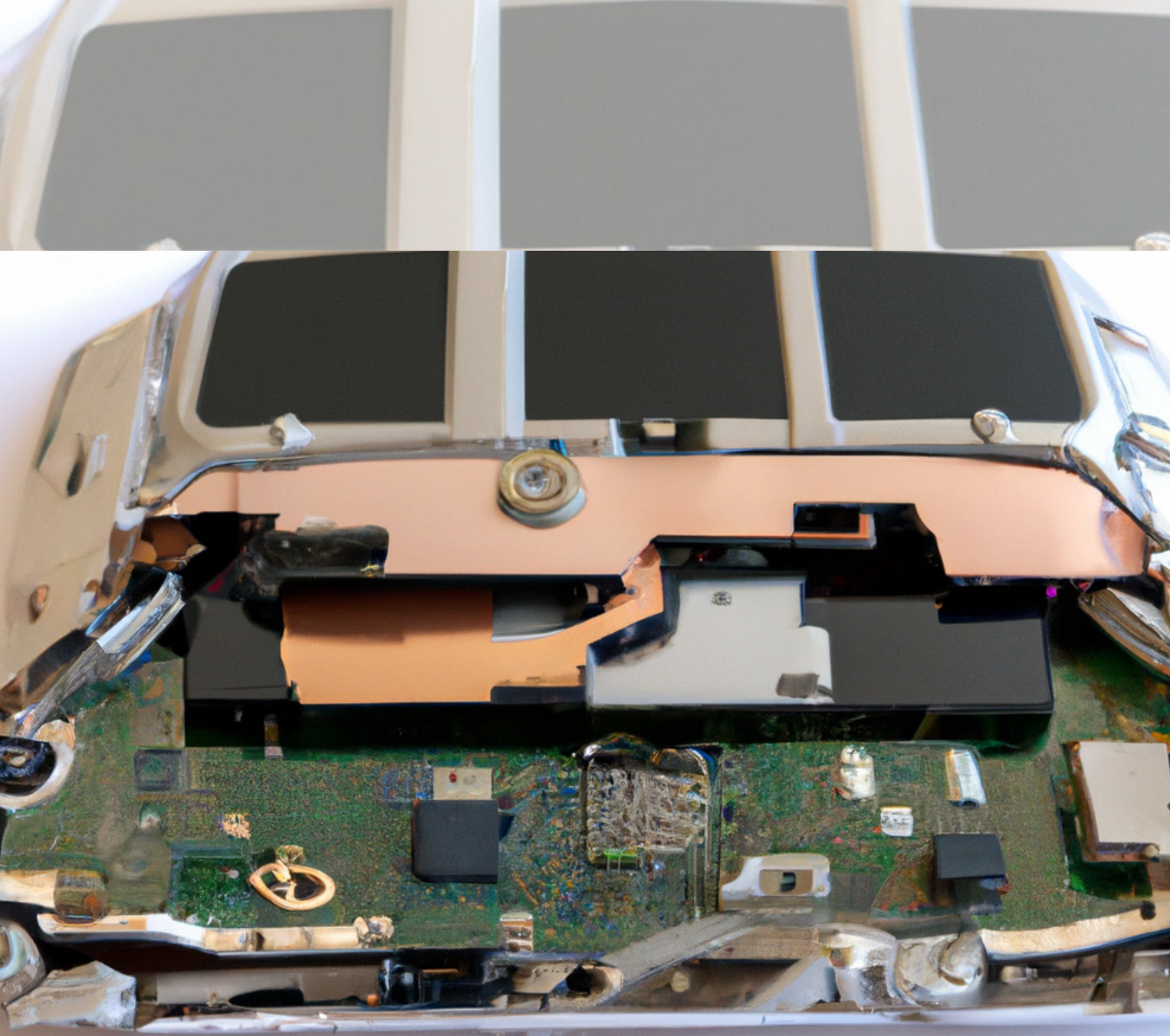
Remove the keyboard from the screen by lifting up the screen.



Close the screen by flipping the computer over.



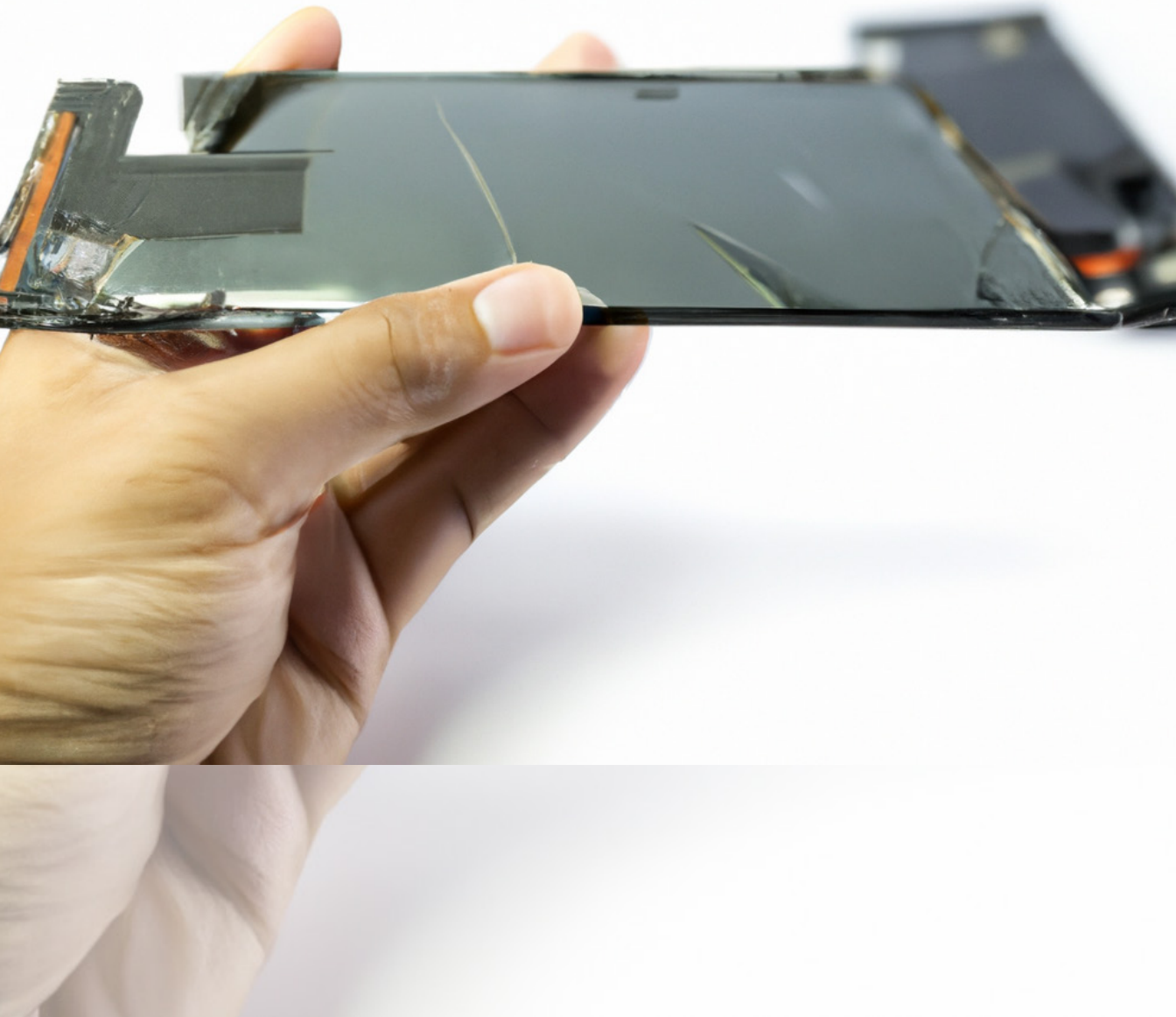
Remove the three 12 mm T6 Torx screws from the internal metal framework with a pair of tweezers.



Turn the computer over.



There are two screens to flip over, remove the two screws from the outer case.



Make sure you take out the screen first.



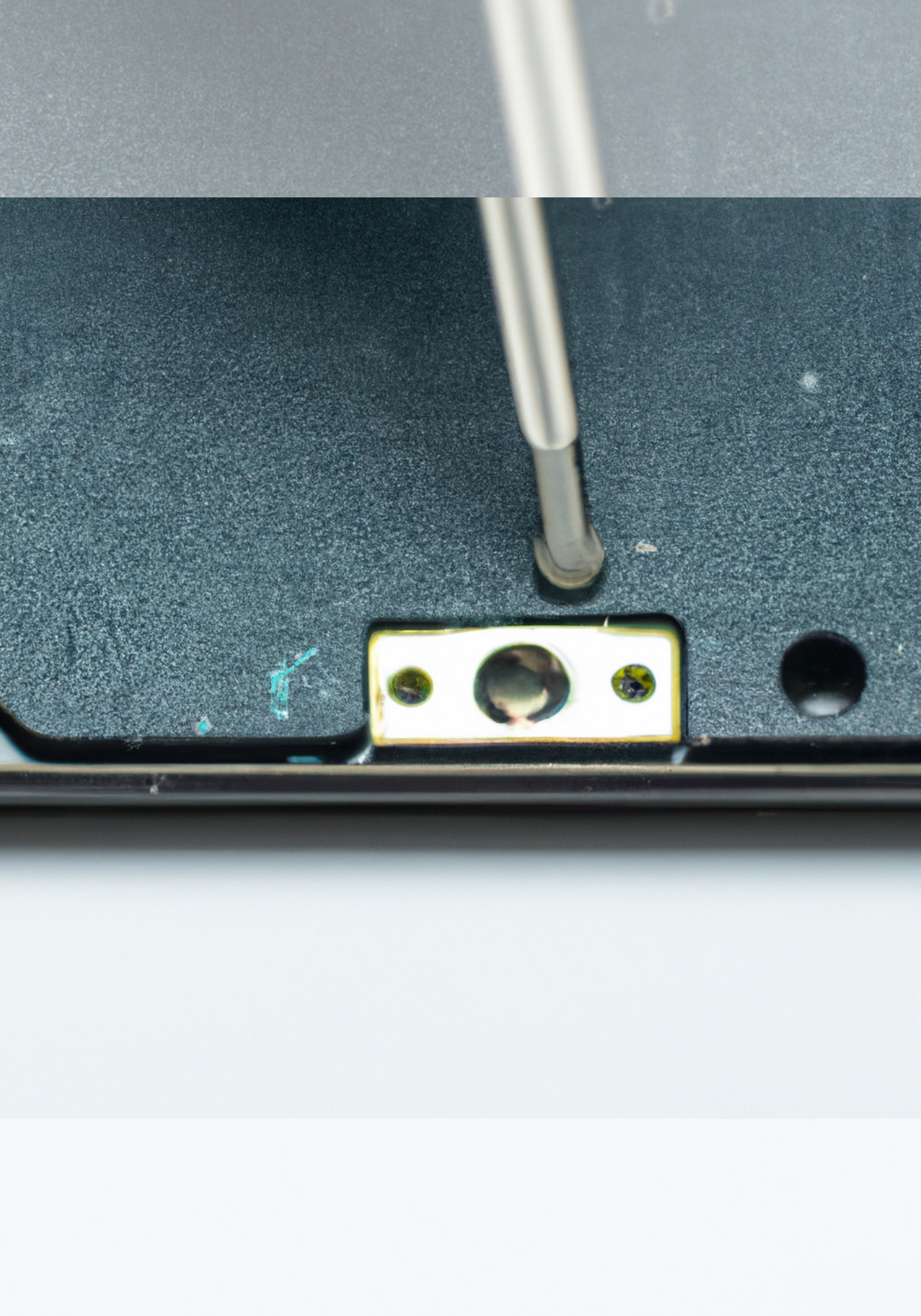
Remove the 11.5 mm T6 Torx screw Jumper from the internal metal framework by lifting it up.



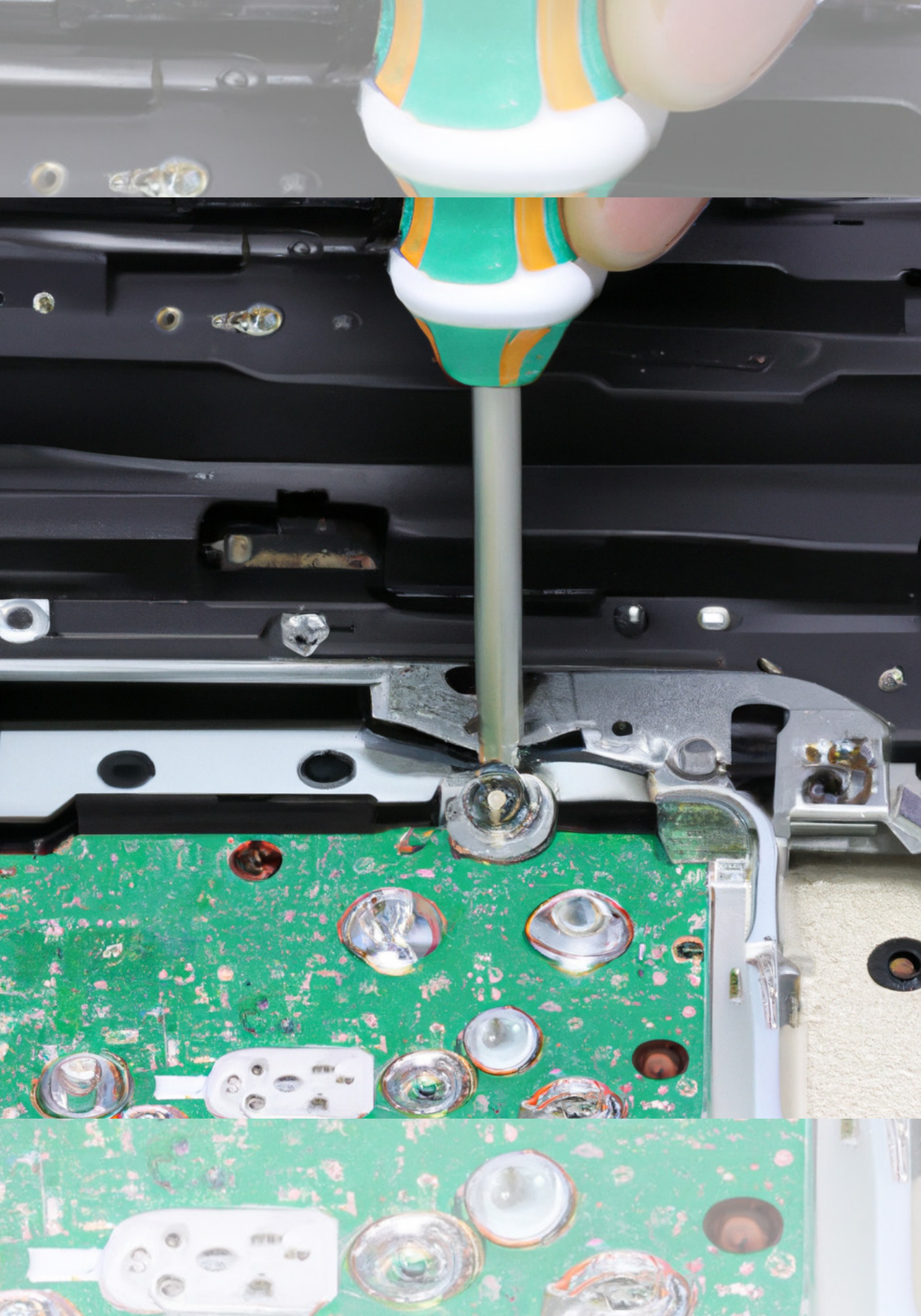
Do not attempt to rotate the display back farther than the hinges allow or your computer may be damaged.



Open the computer with the display facing you and rotate the display back as far as possible.



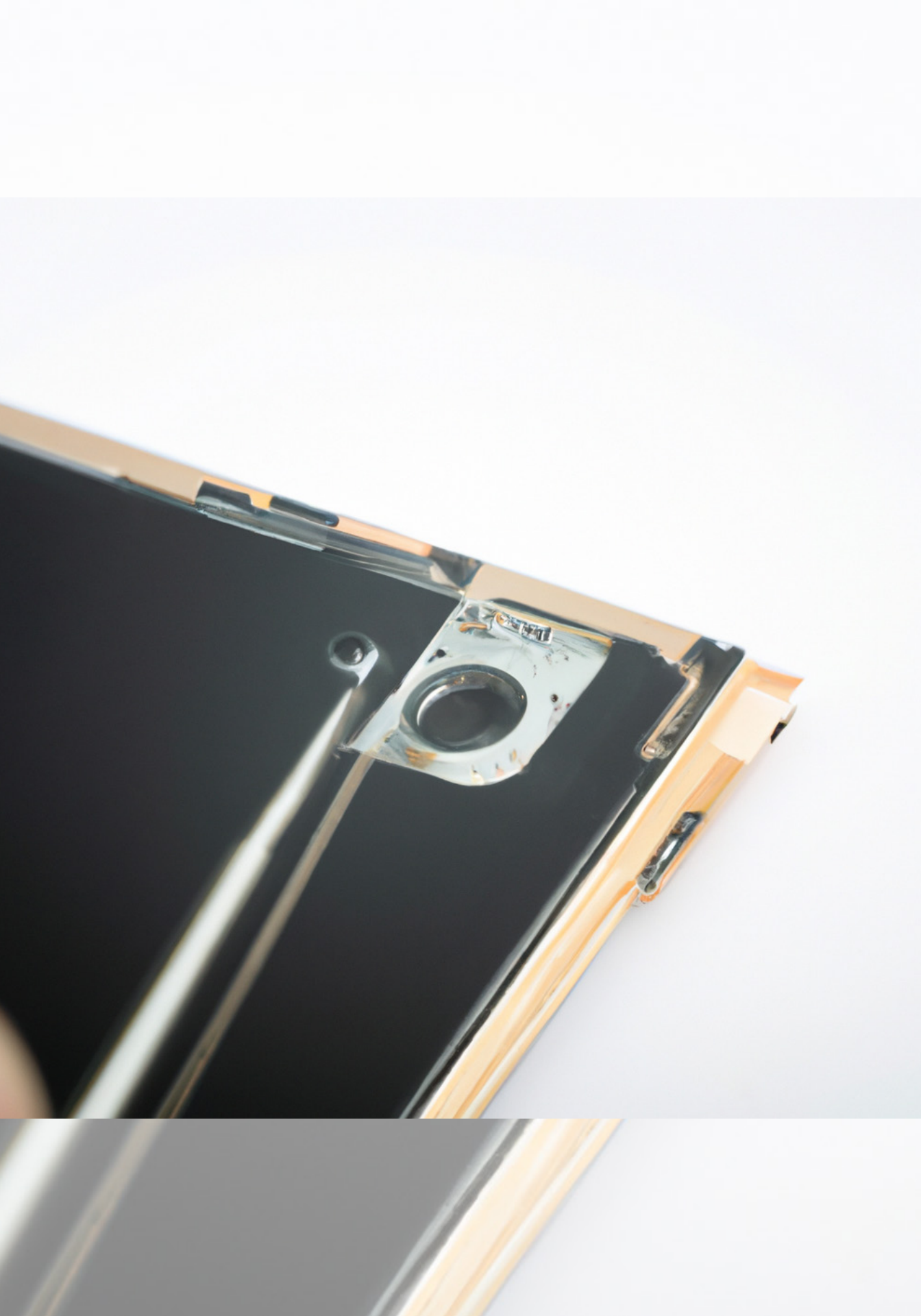
Remove the T6 Torx screw from the bottom left corner of the display assembly.



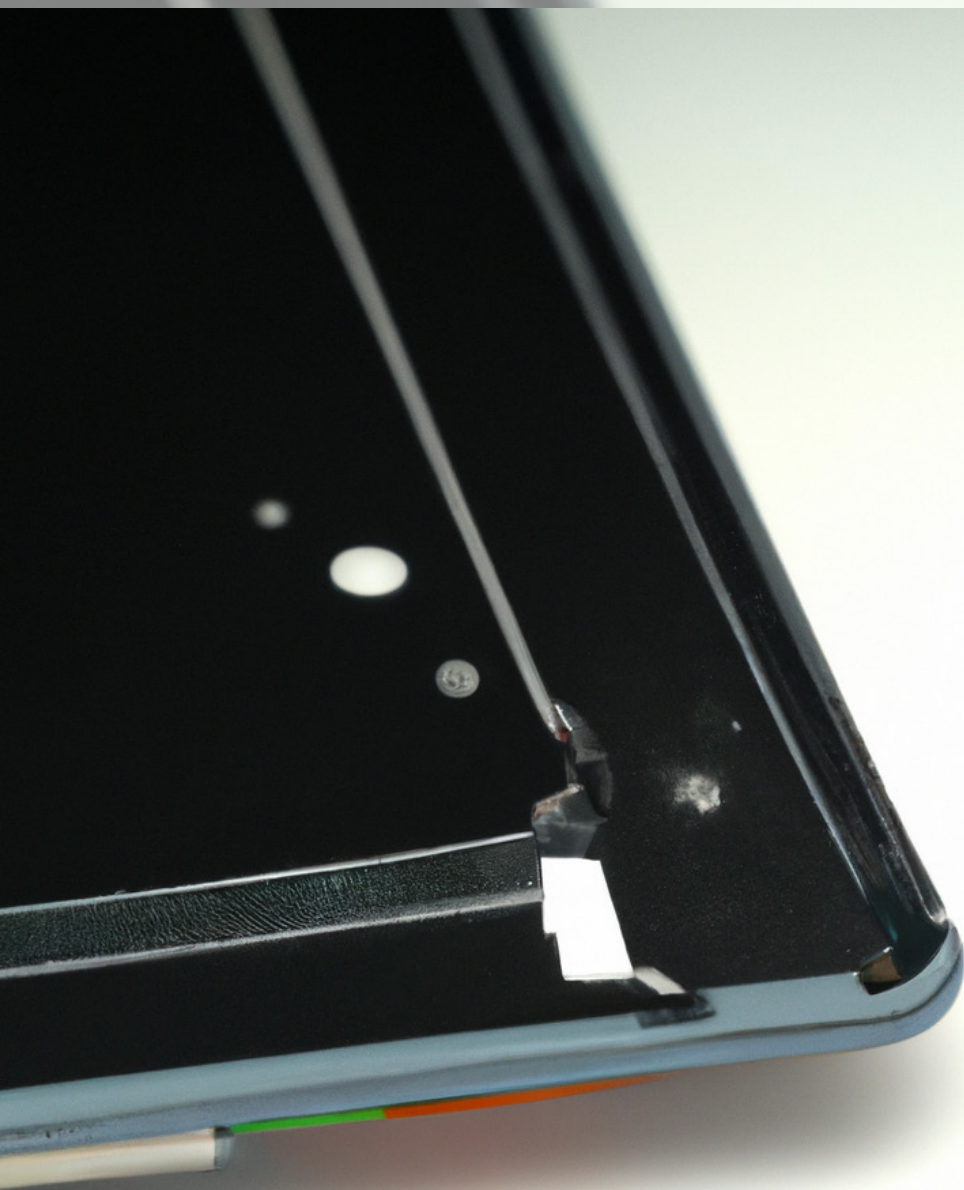
The computer casing will not allow the screwdriver to be inserted directly into the screw, so be careful not to strip the screw.



Remove the T6 Torx screw from the bottom right corner of the display assembly.



**Press the display latch release
and open the display slightly.**



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Push the LCD away from the front display bezel near its top edge.



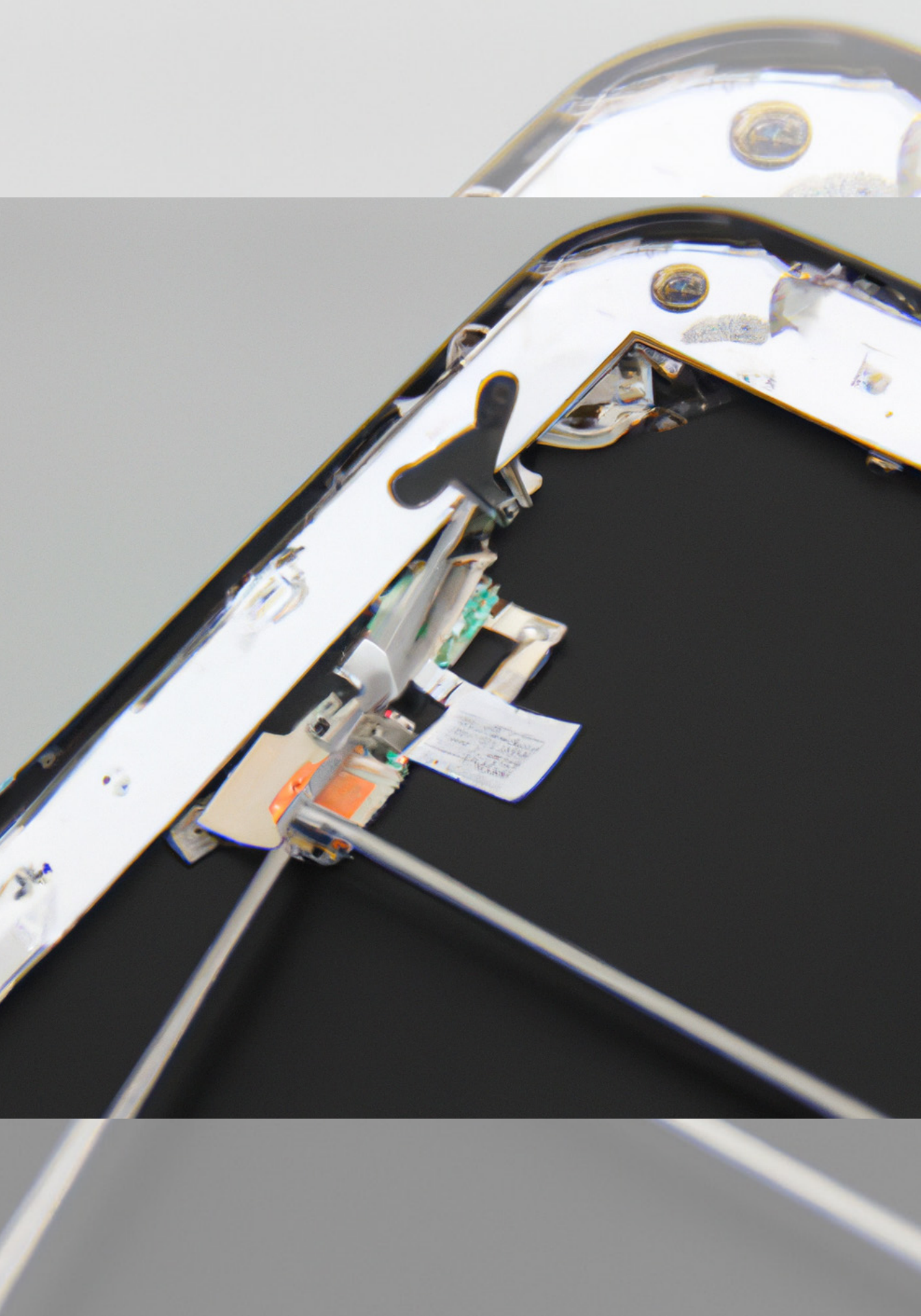
The next few steps require the use of plastic opening tools and spudgers that will probably be destroyed in the process.



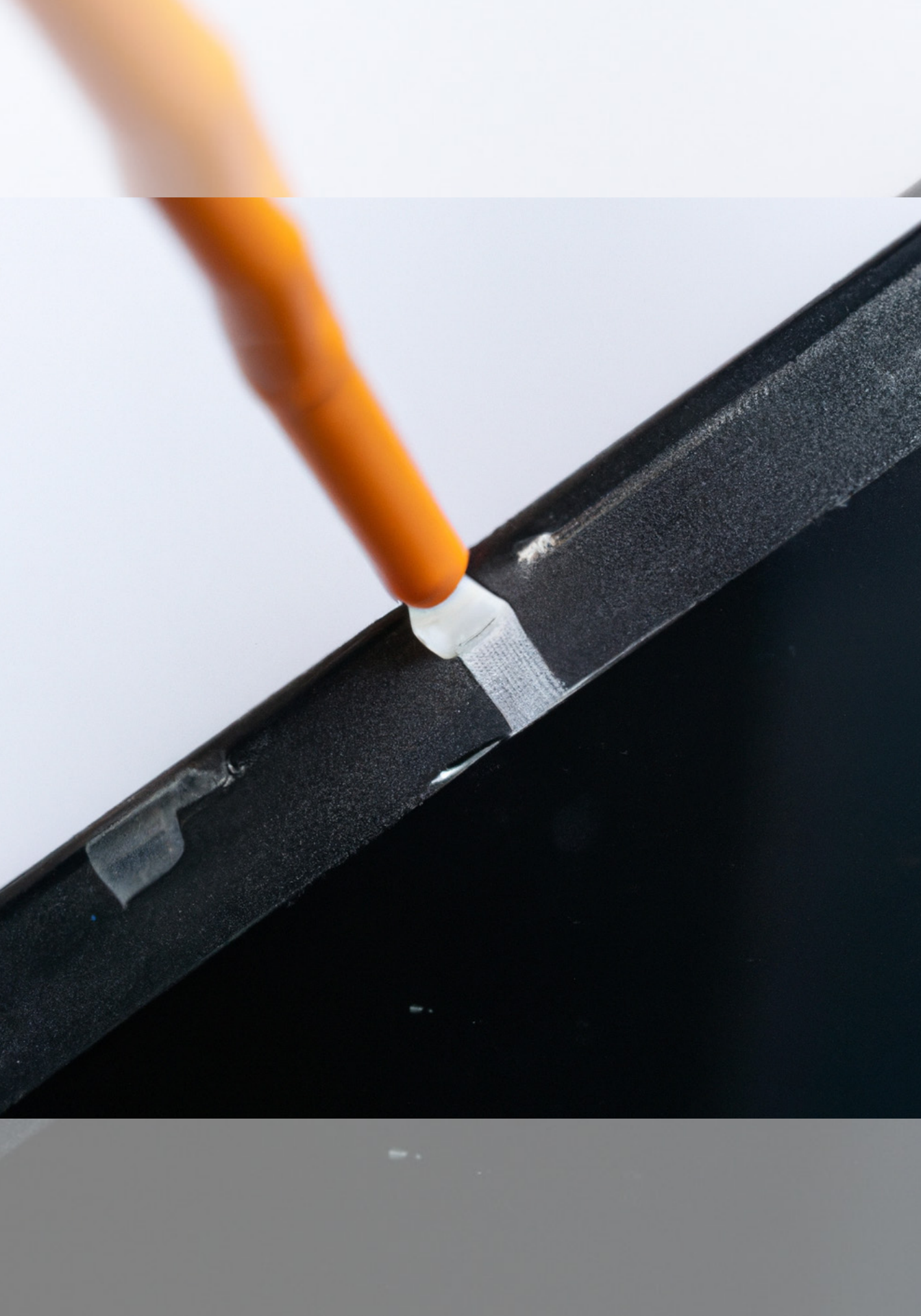
Have a few spares of each tool handy.



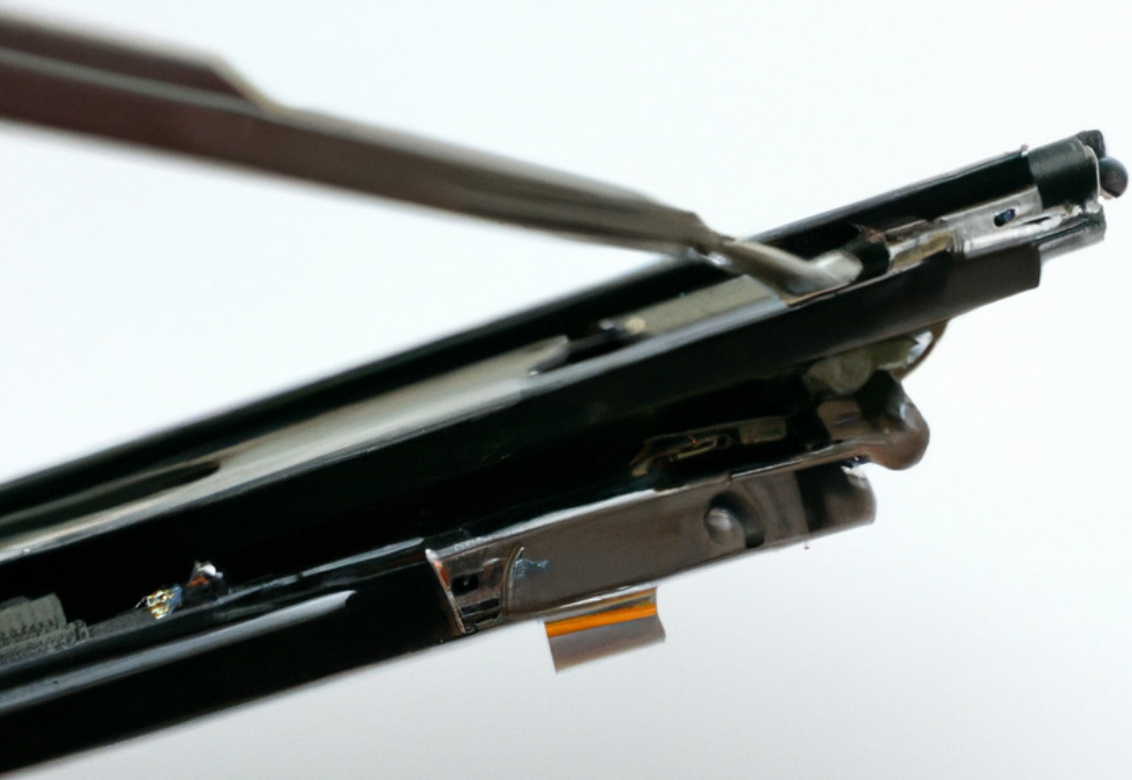
Lift the LCD off the front bezel enough to insert the flat end of a spudger between the metal LCD frame and the front display bezel.



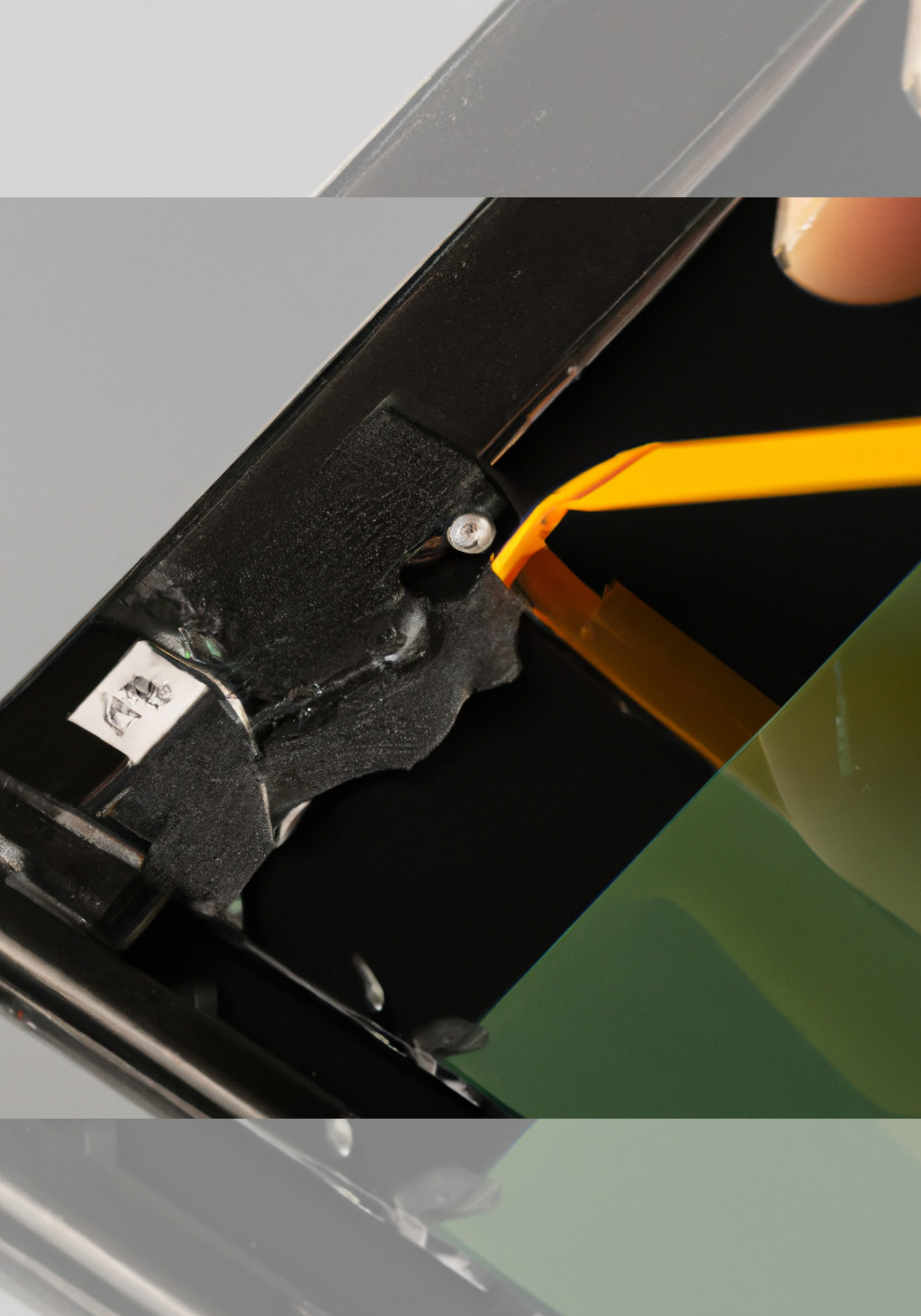
Trying to insert your spudger between the LCD glass and the inner metal LCD frame will surely damage your LCD.



Run your spudger along the lower edge of the front display bezel to separate the adhesive from the LCD frame.



Pull the LCD towards the top edge of the front display bezel, minding any cables that may get tangled.



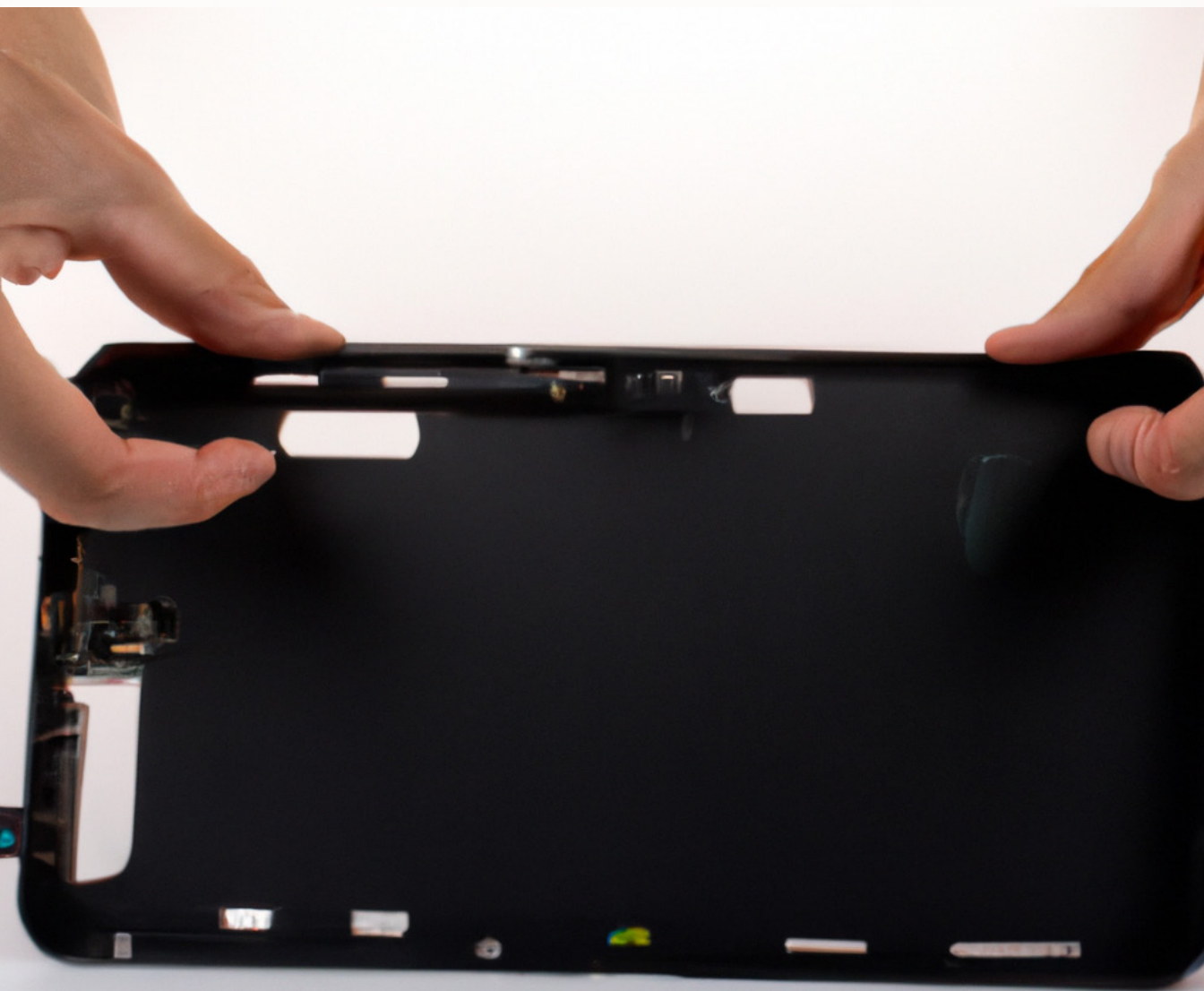
Now that the top edge is released, use a spudger to completely release the clips along the left edge of the display.



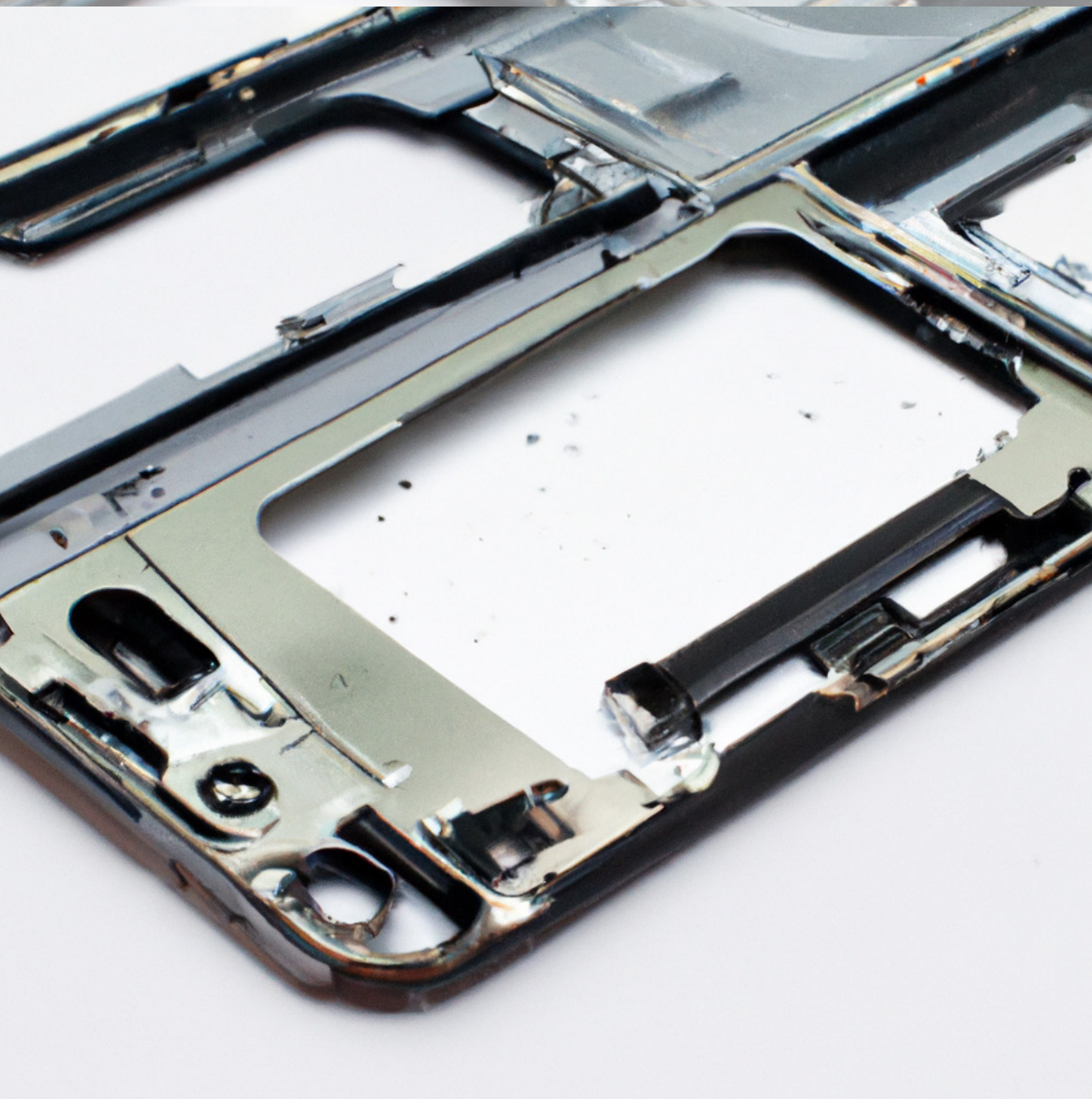
Grip the back corners of the upper case and pull up.



Do not pull the upper case off yet; you still need to disconnect the keyboard and trackpad cable.



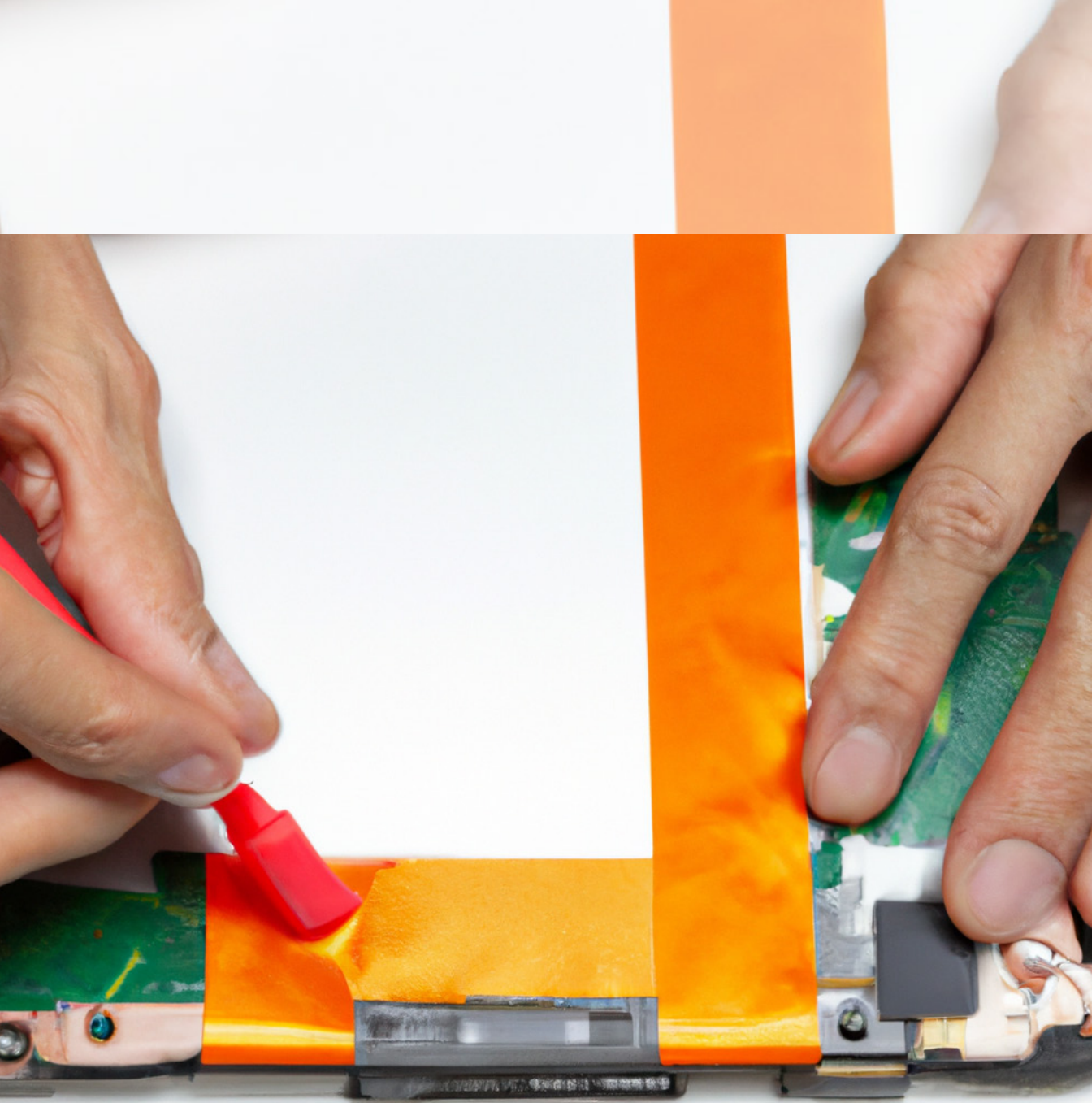
Lift the back of the case up and work your fingers along the sides, freeing the case as you go.



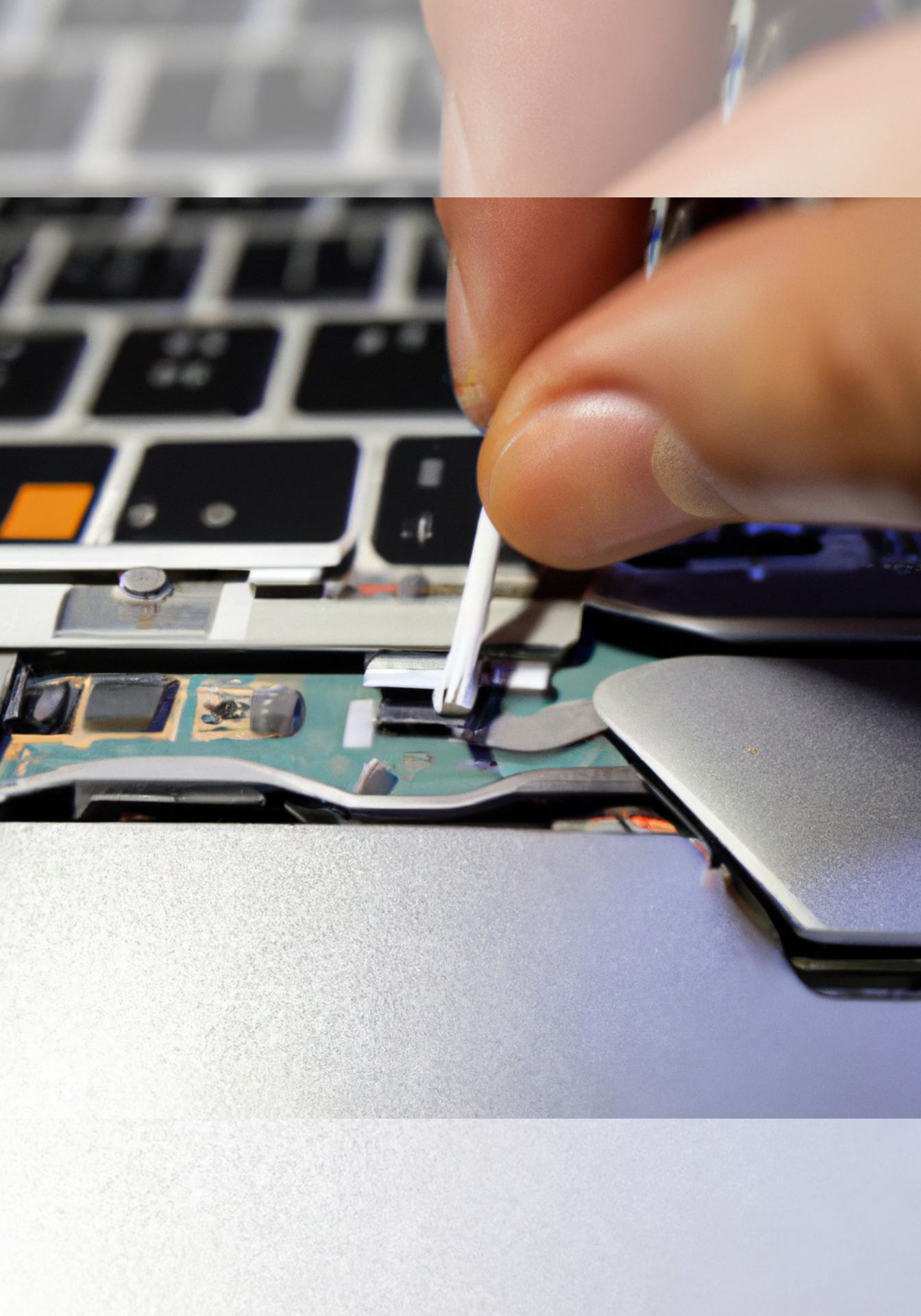
**Once you have freed the sides,
you may need to rock the case
up and down to free the front of
the upper case.**



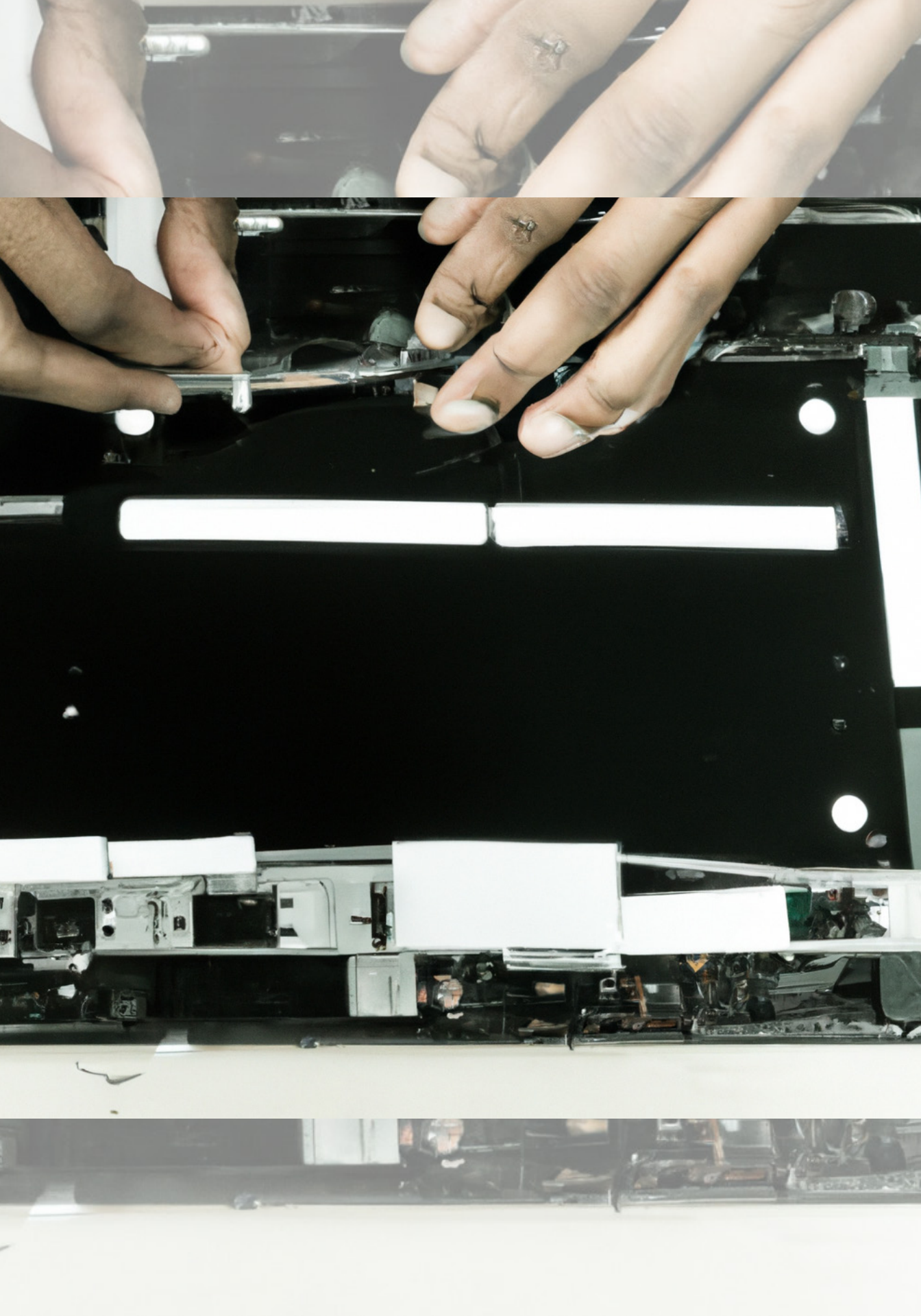
Rotate the upper case up and towards the display, so that the upper case rests against it.



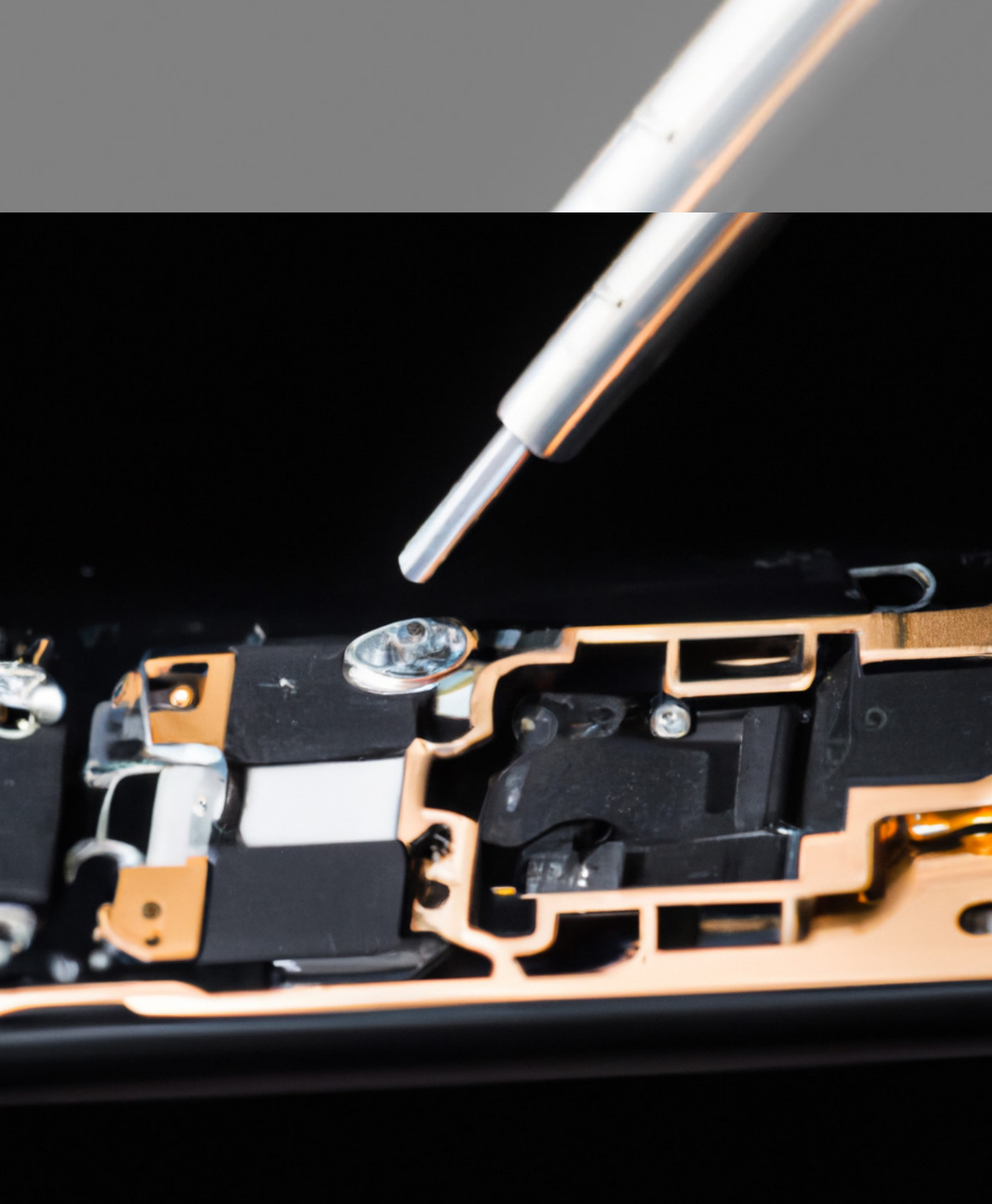
**Remove the orange tape
securing the trackpad ribbon to
the logic board.**



Disconnect the trackpad ribbon from the logic board by pulling up on the connector itself.



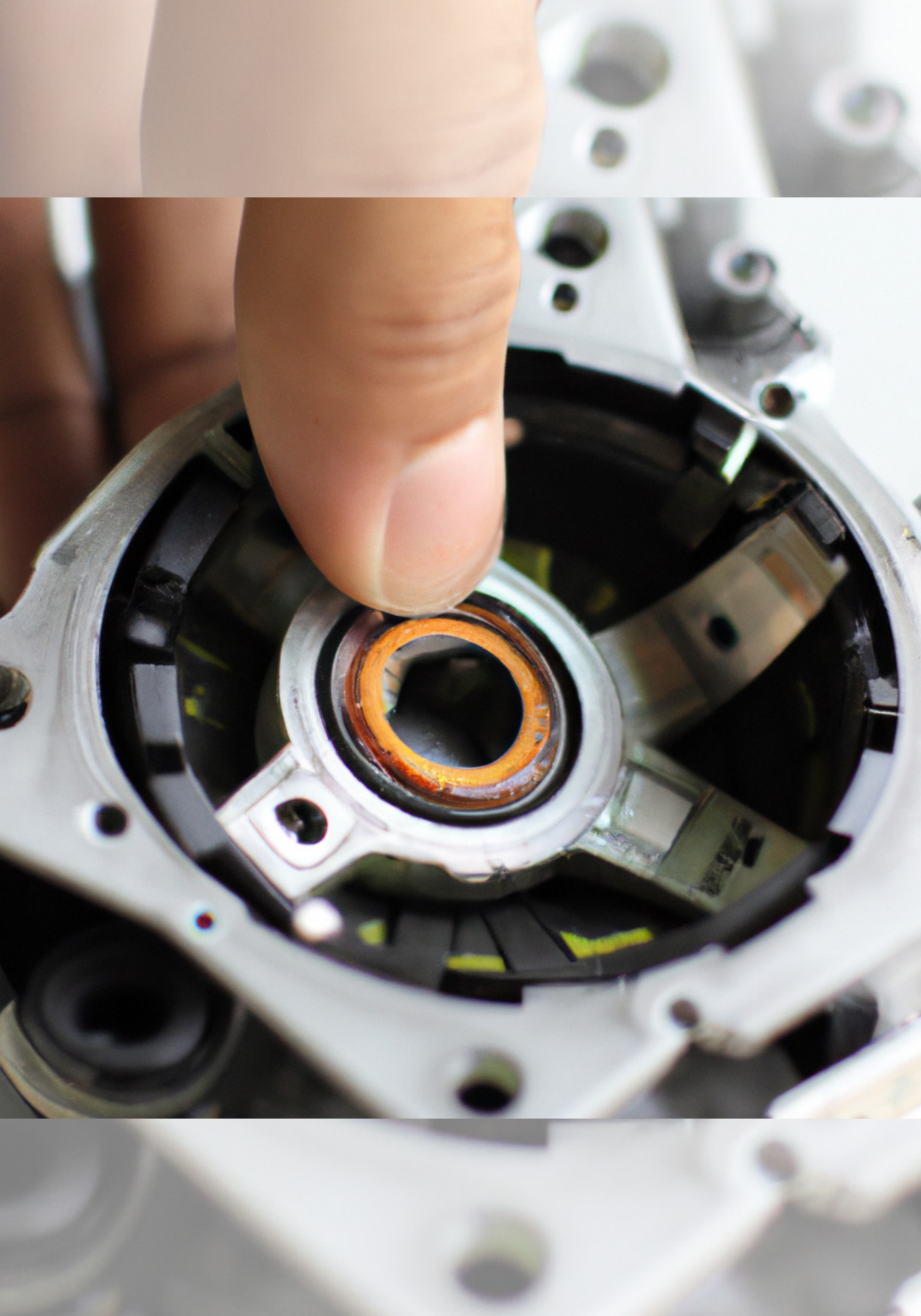
Remove the upper case from the computer.



Close the display.



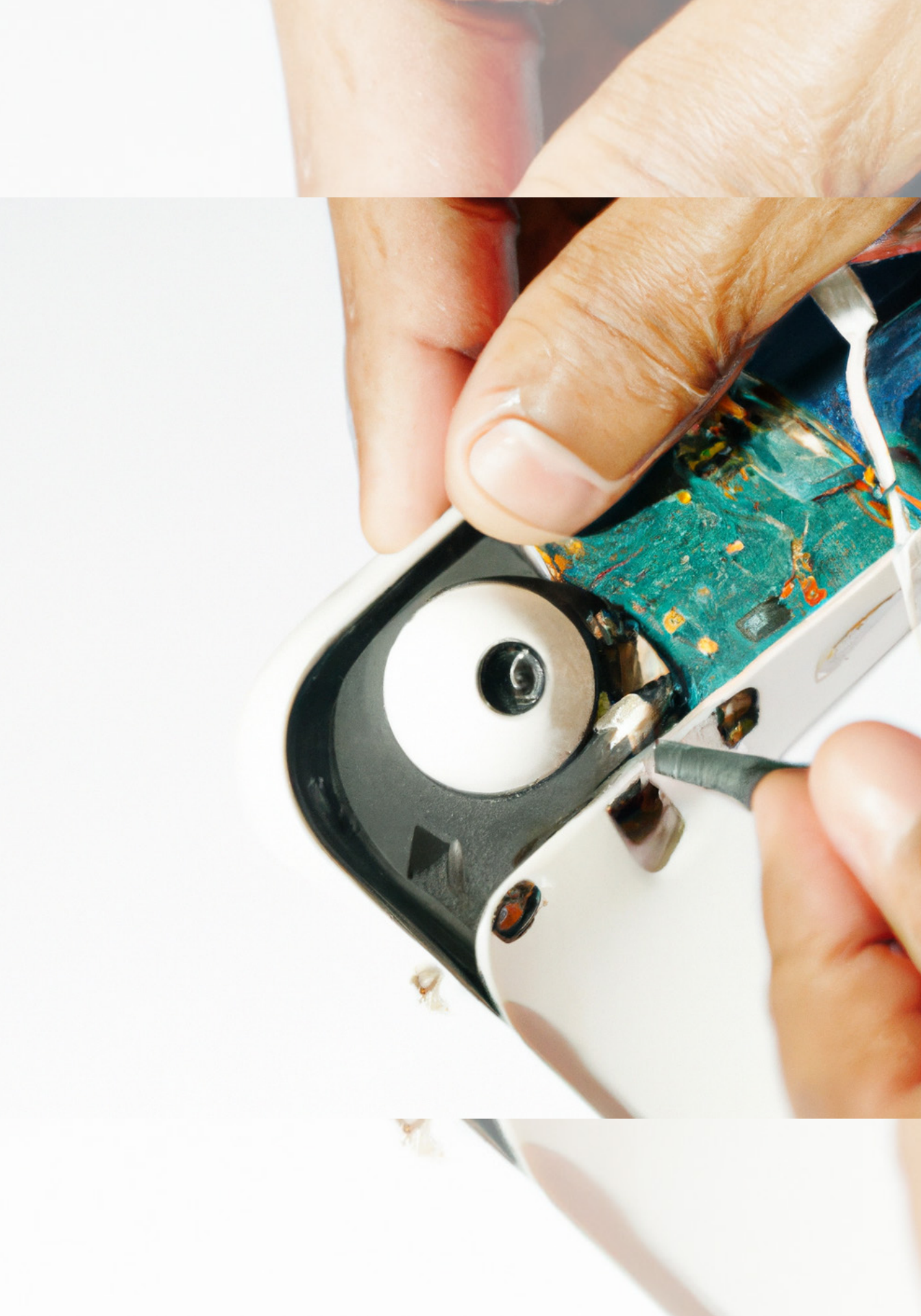
The rear bezel is still attached to the display by the antenna cables.



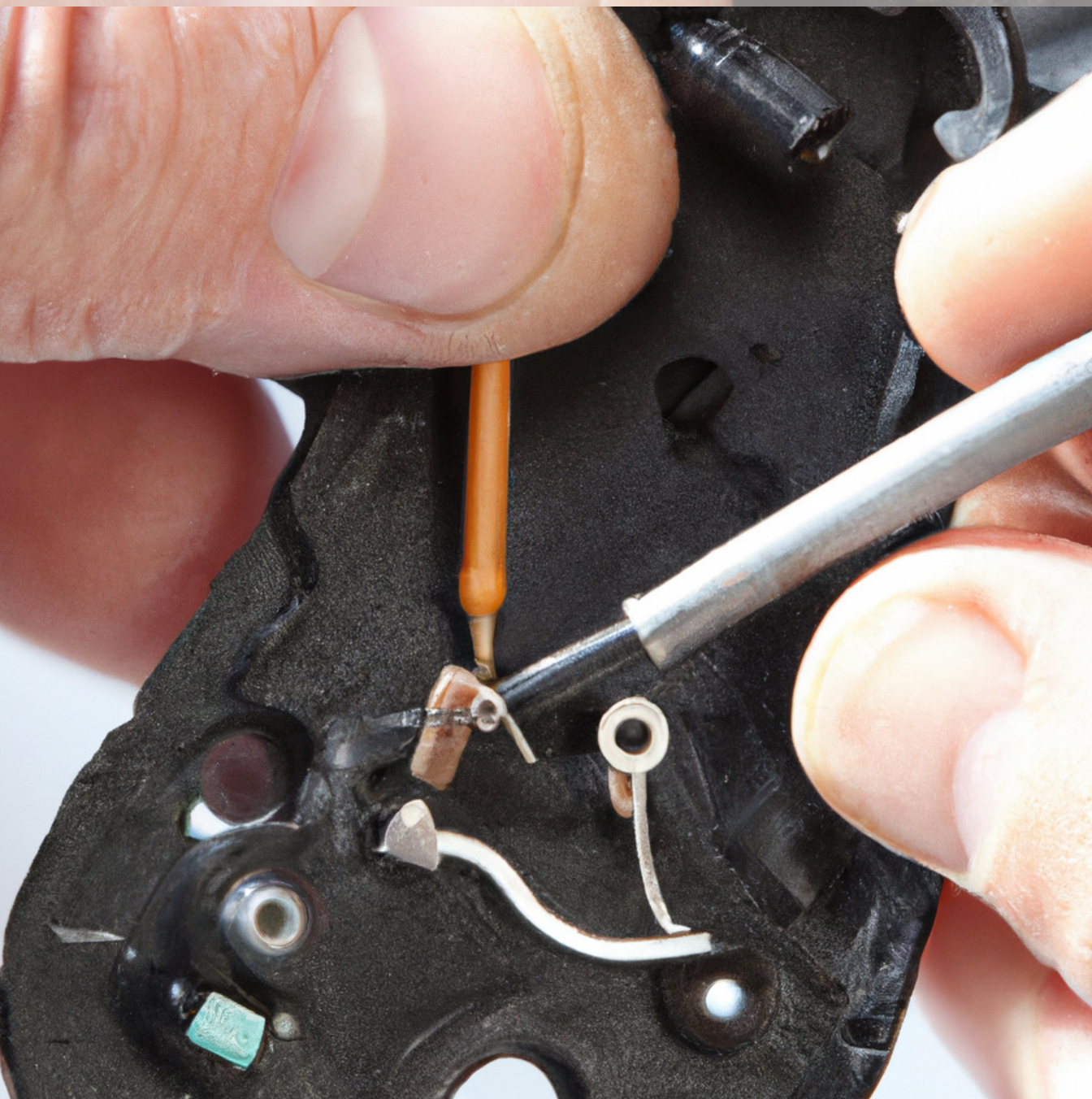
Carefully lift the antenna board out of the clutch assembly.



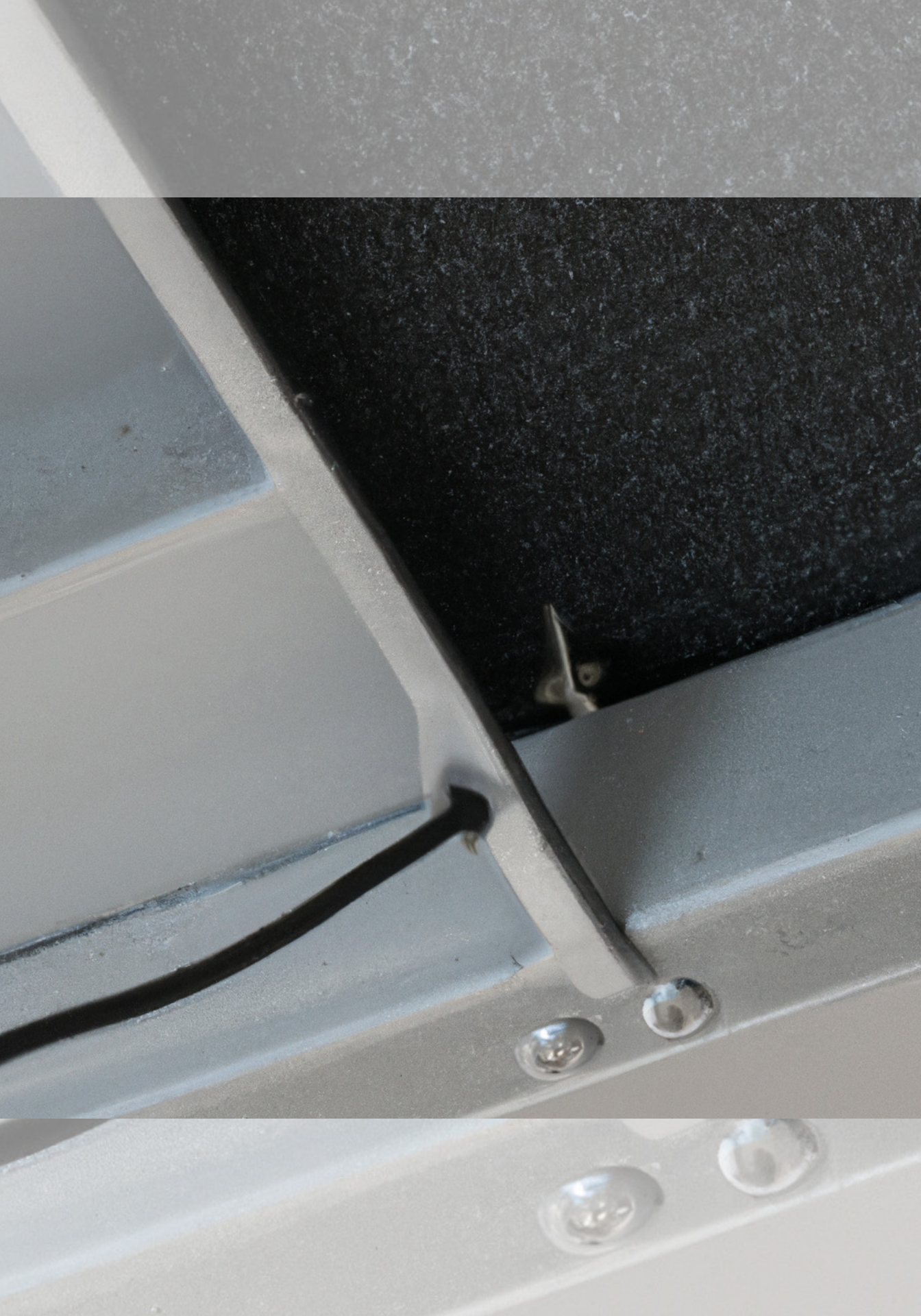
Peel the three self-adhesive flaps off the plastic cover on the underside of the antenna board.



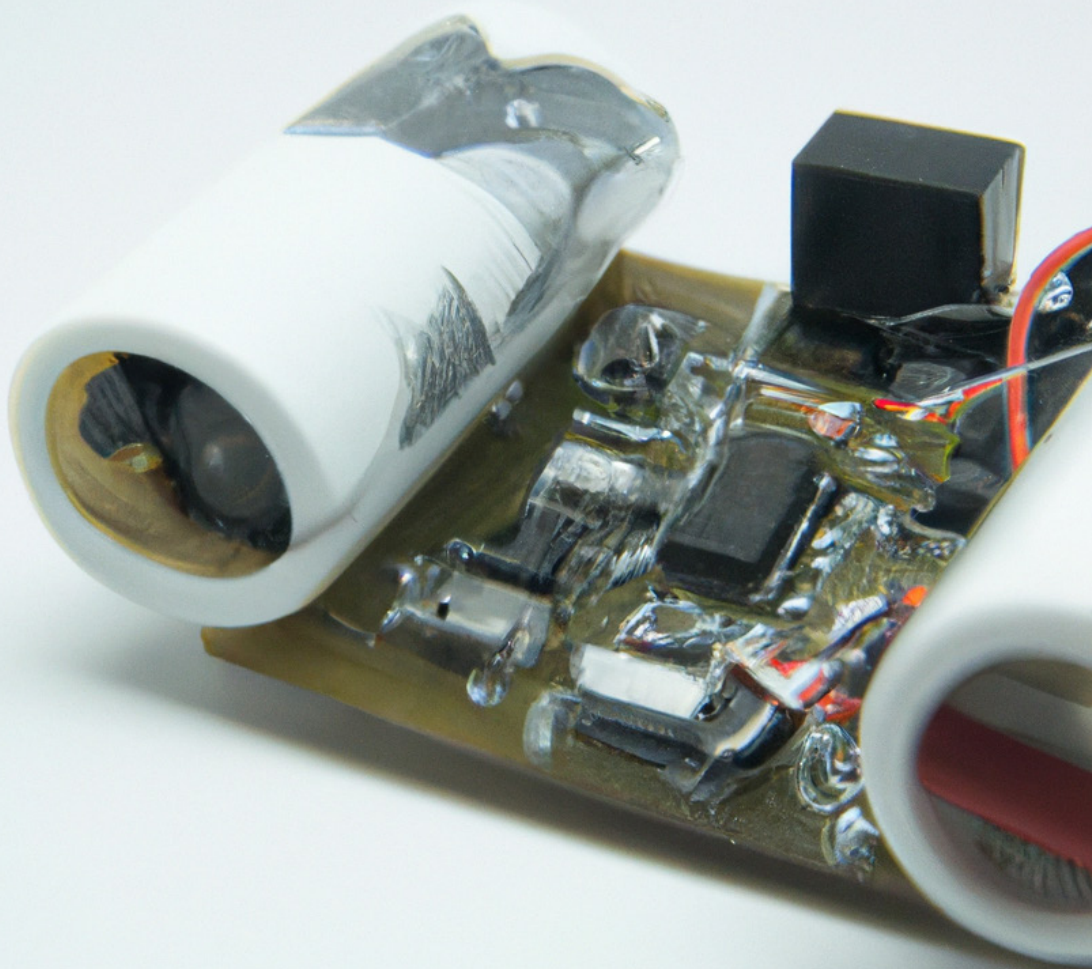
Remove the protective plastic cover from the antenna board.



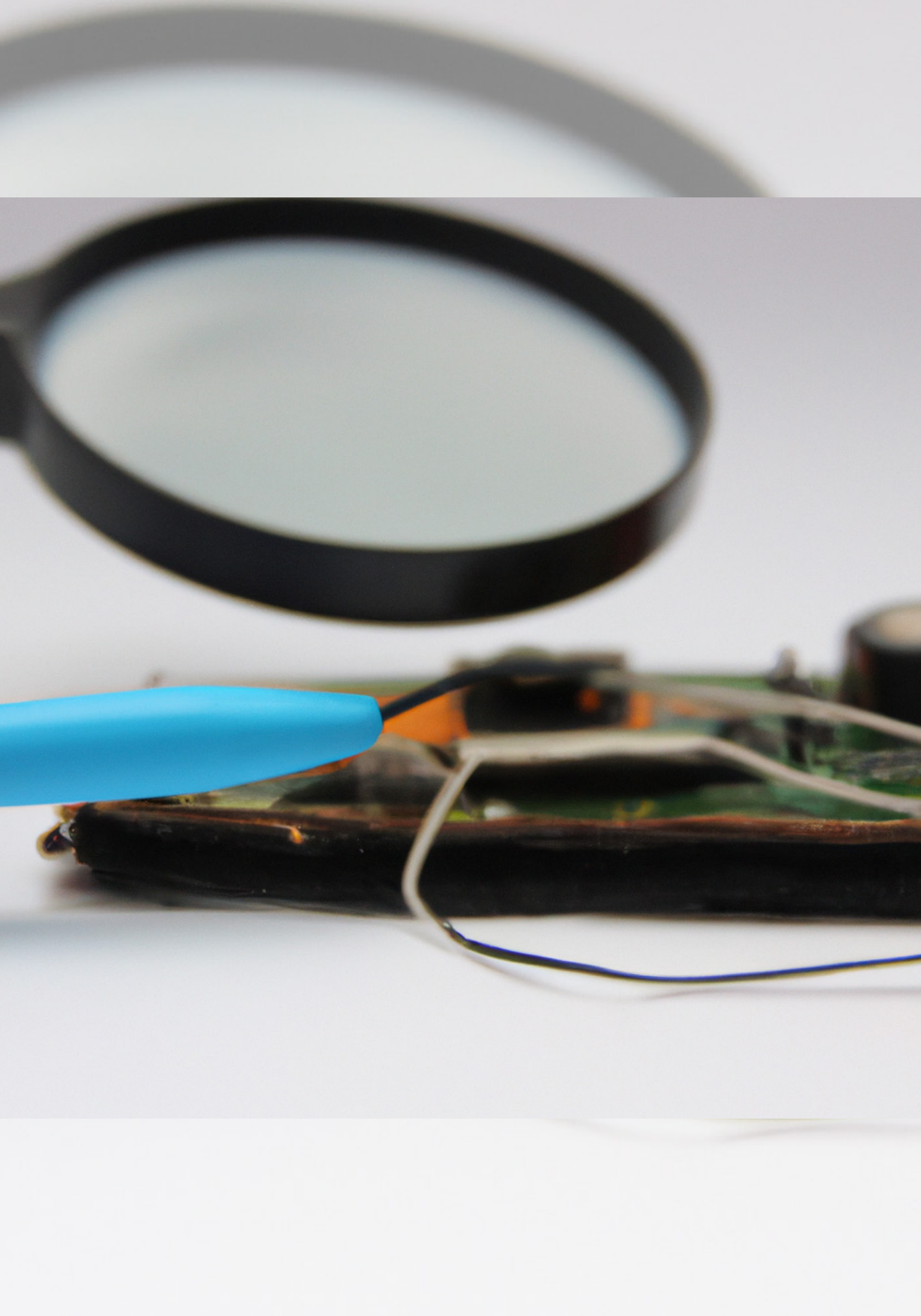
Use the flat end of a spudger to disconnect both antenna connectors from the antenna board.



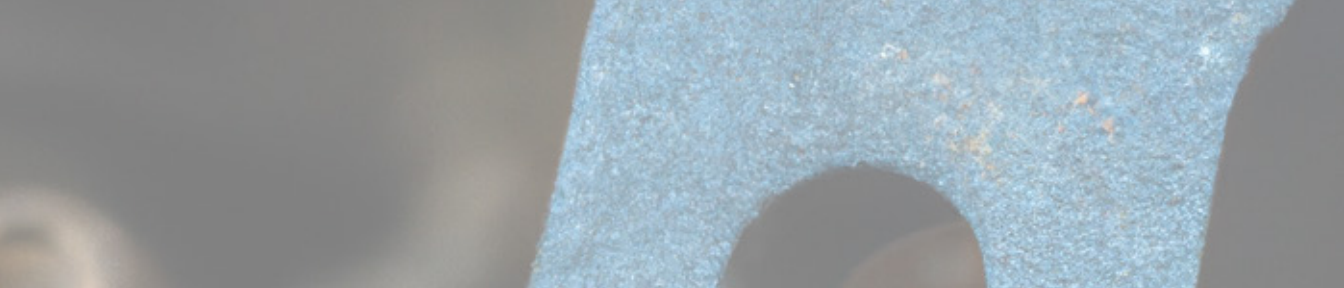
The gray antenna attaches near the corner of the antenna board.



The inverter is an extremely thin circuit board that is very delicate and easily cracked.



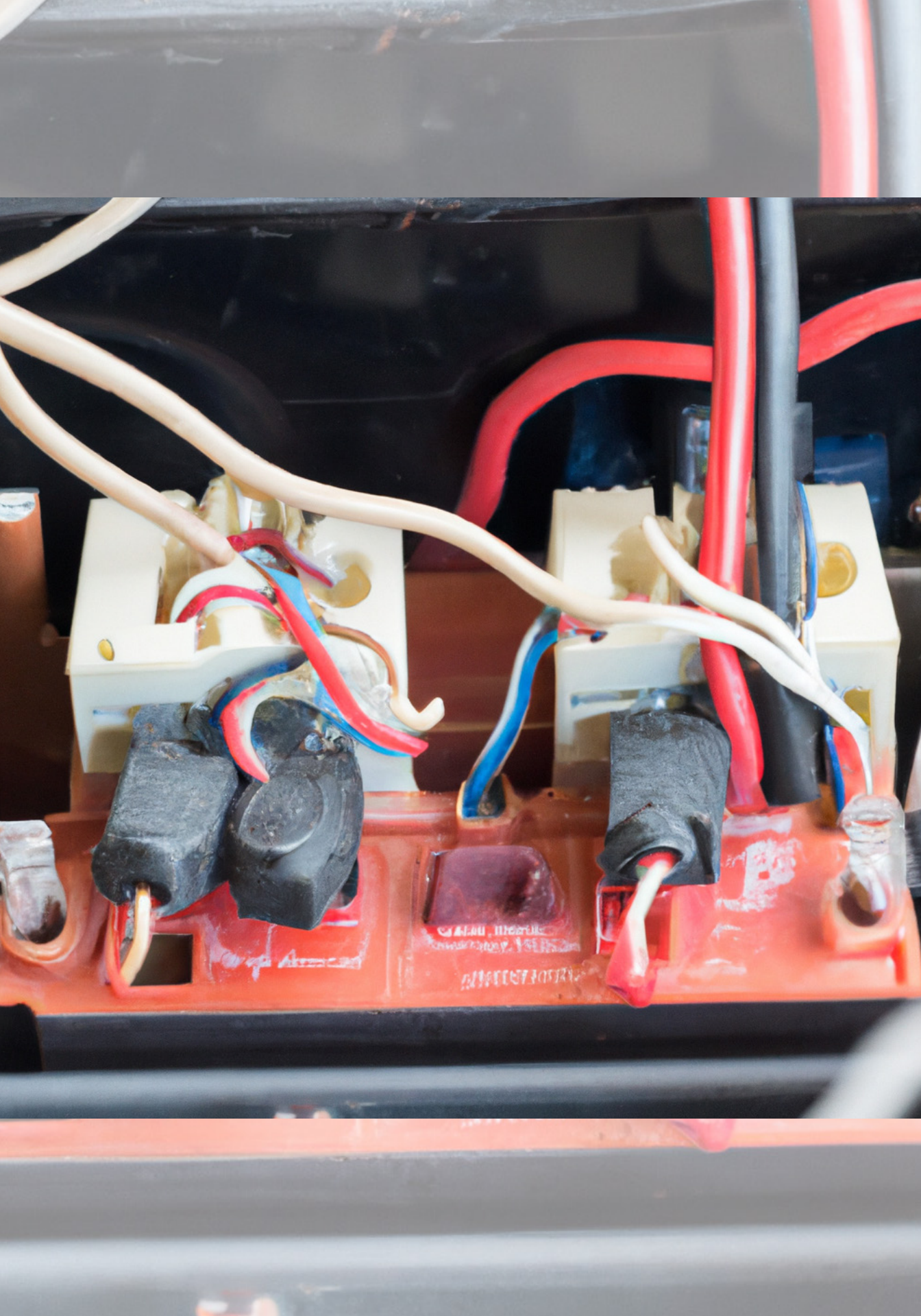
Take care when handling it.



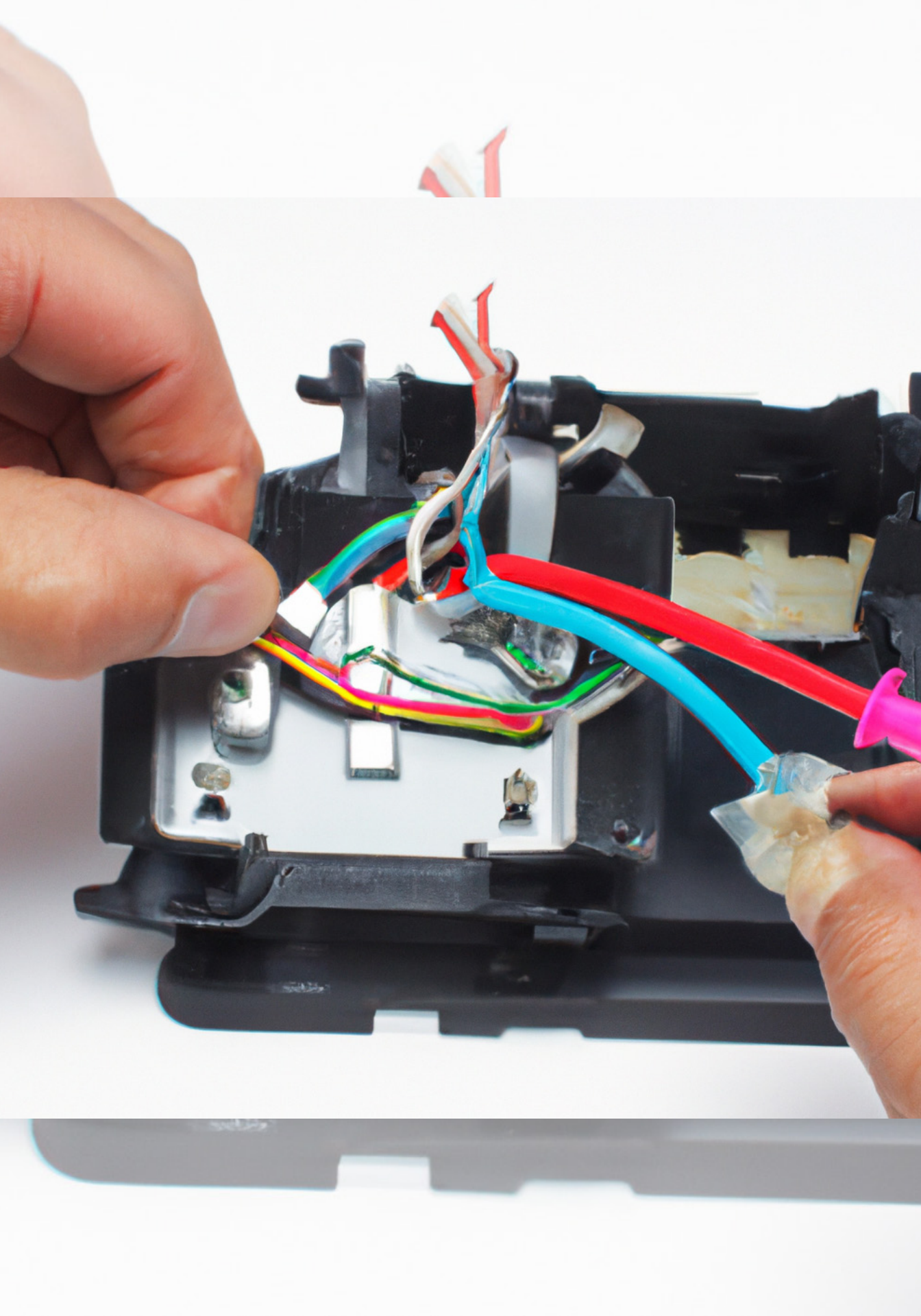
Using the tip of a spudger, raise the inverter out from under the clutch cover.



Lift the inverter enough to reveal both cable connectors.



Lift the inverter enough to reveal both cable connectors.



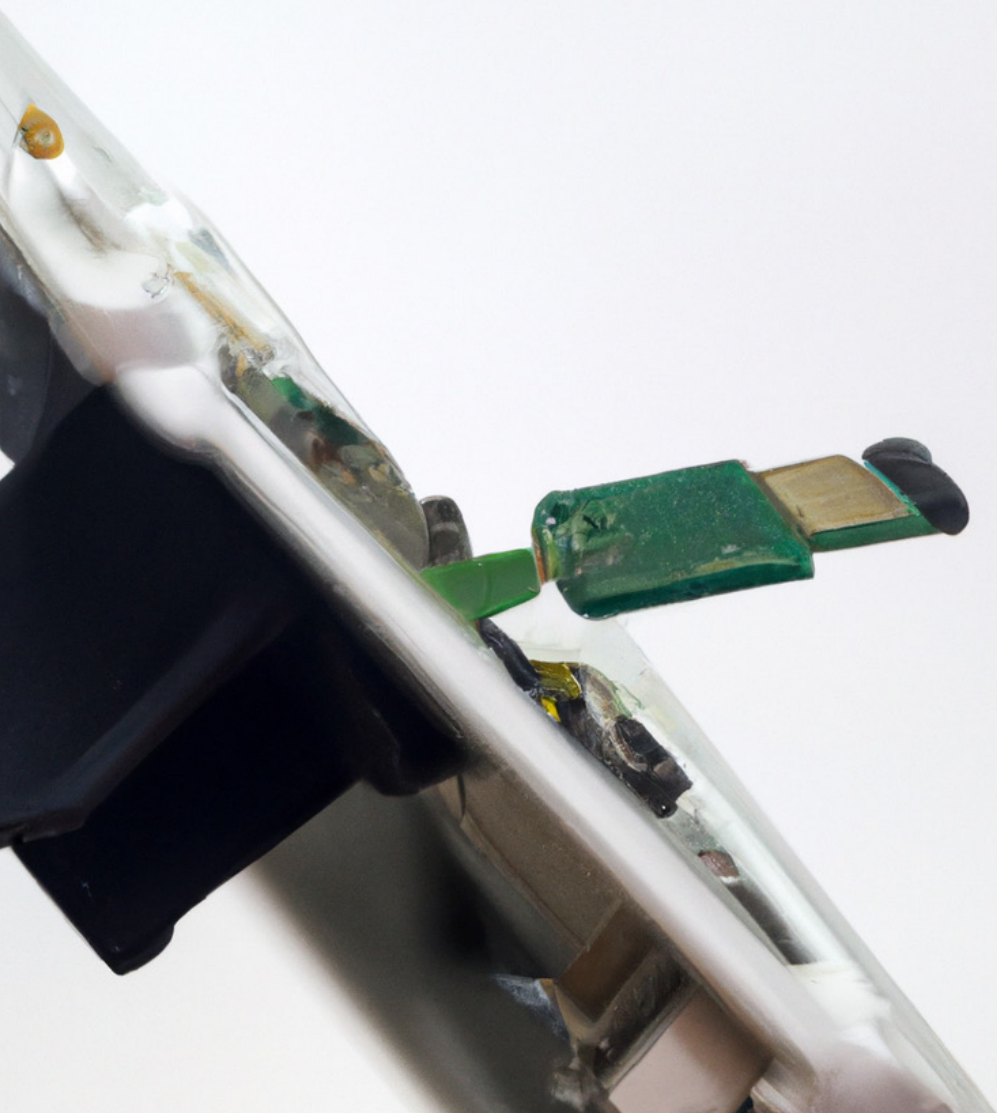
Disconnect both inverter cables by pulling their connectors off the sockets on the inverter board.



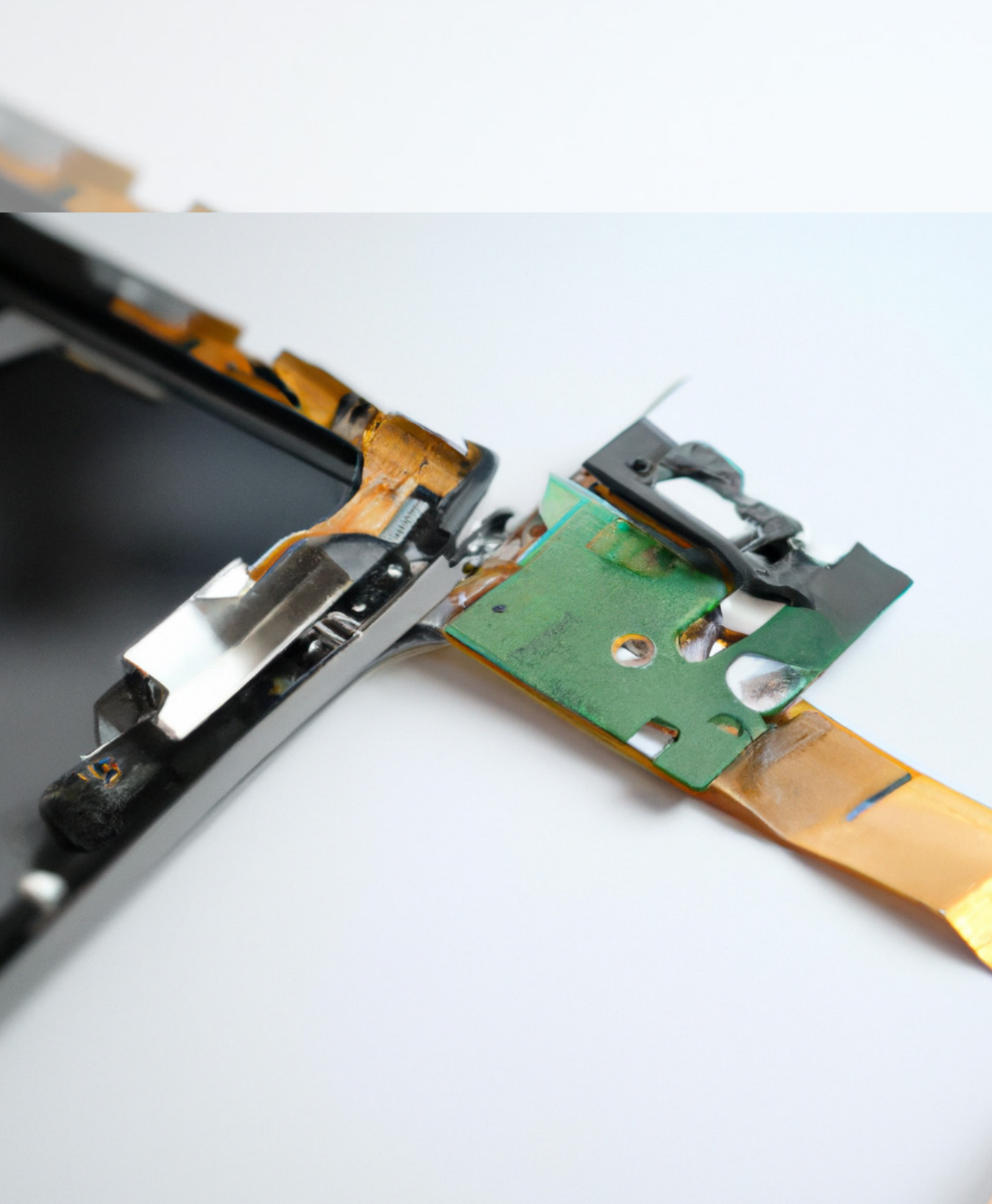
Remove the inverter from the display.



If necessary, remove the piece of tape covering the display data cable connector.



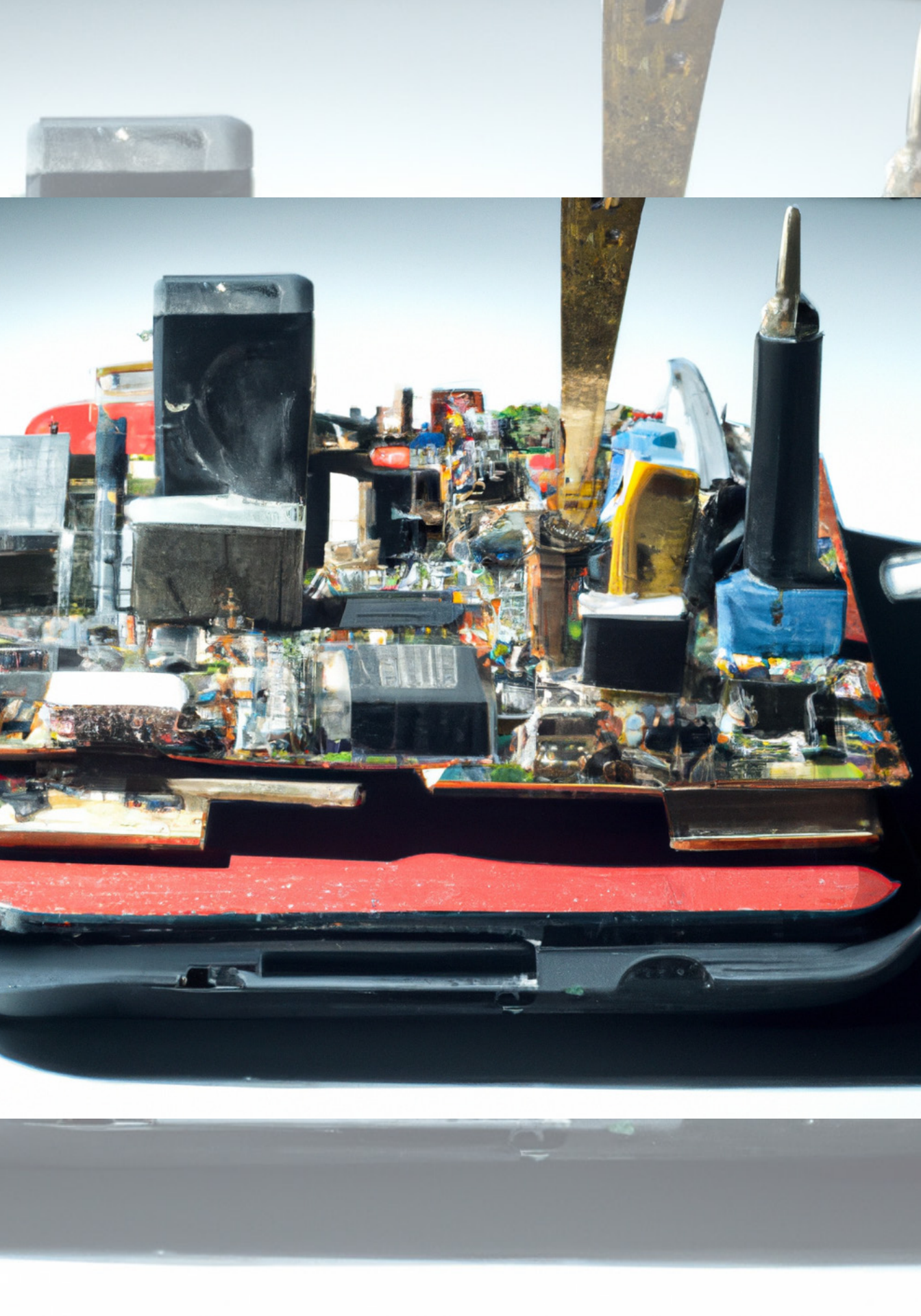
Pull the display data cable connector off its socket to disconnect it from the LCD.



Remove the piece of foil tape securing the display data cable to the LCD frame.



**Remove the two small black
Phillips screws from both sides of
the display (four screws total).**



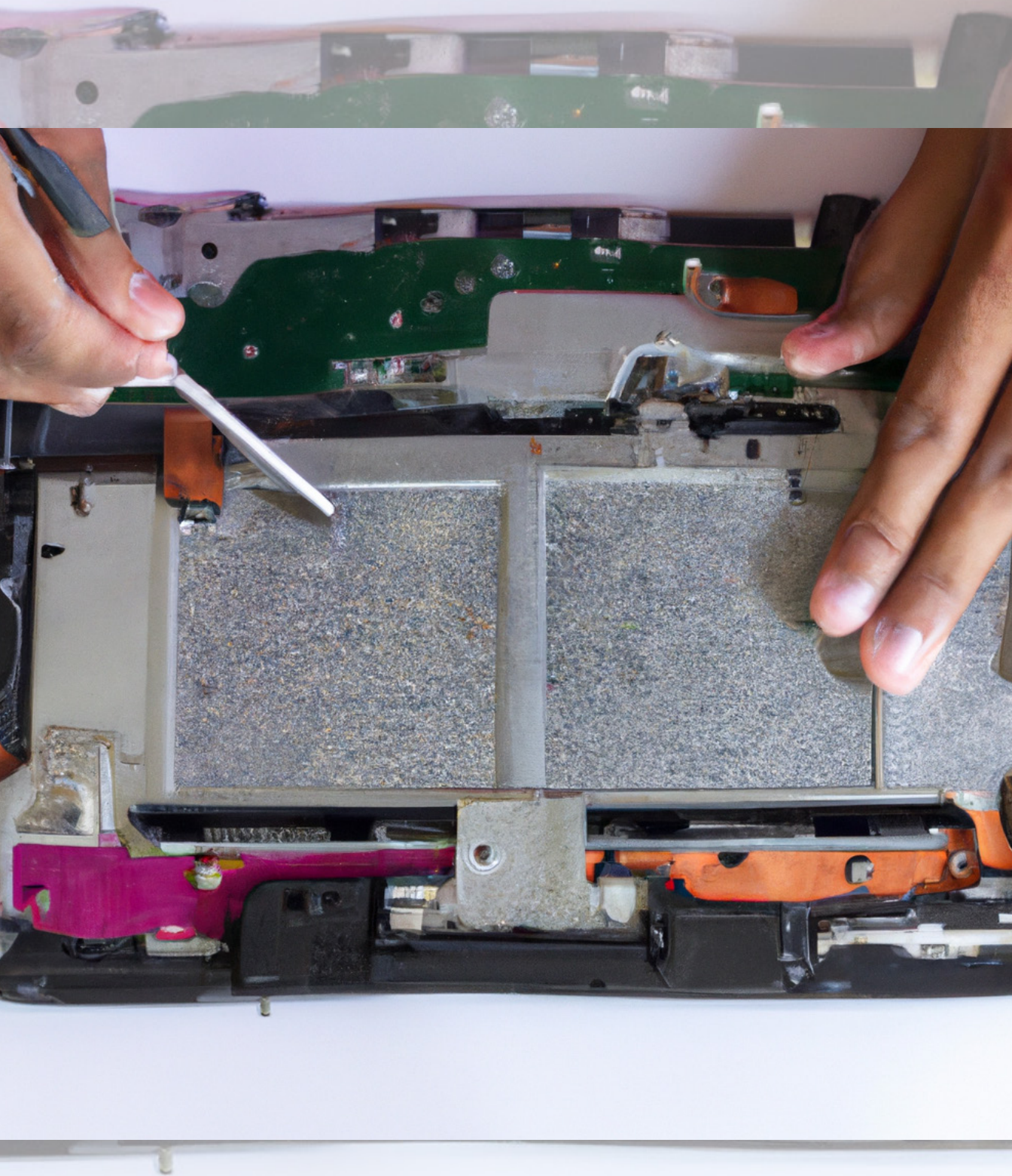
Now that all of that bulky plastic is out of the way, we can get to the fun stuff – electronics!



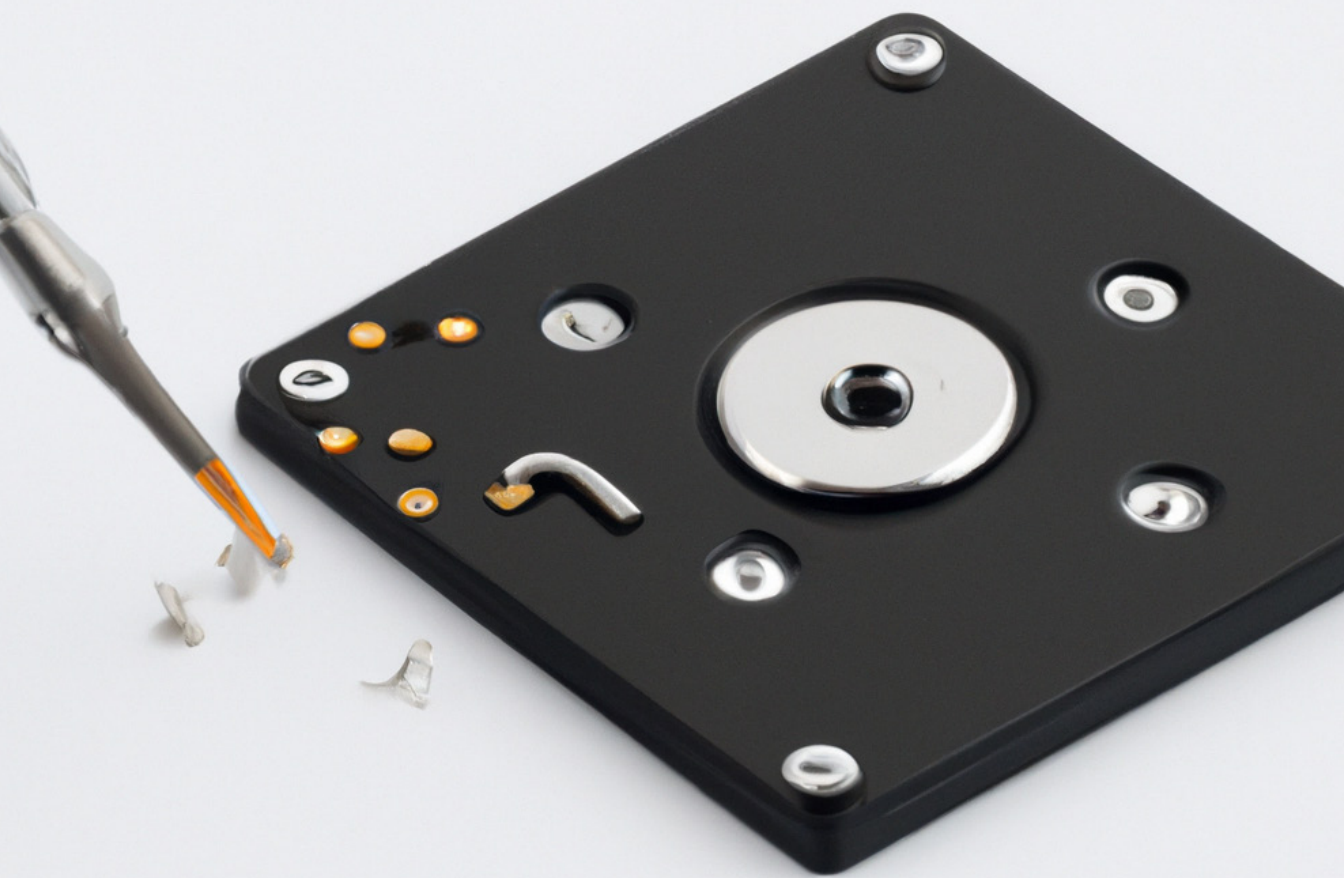
Remove the 23 mm Phillips III hex nut from the HDD with a metal spudger.



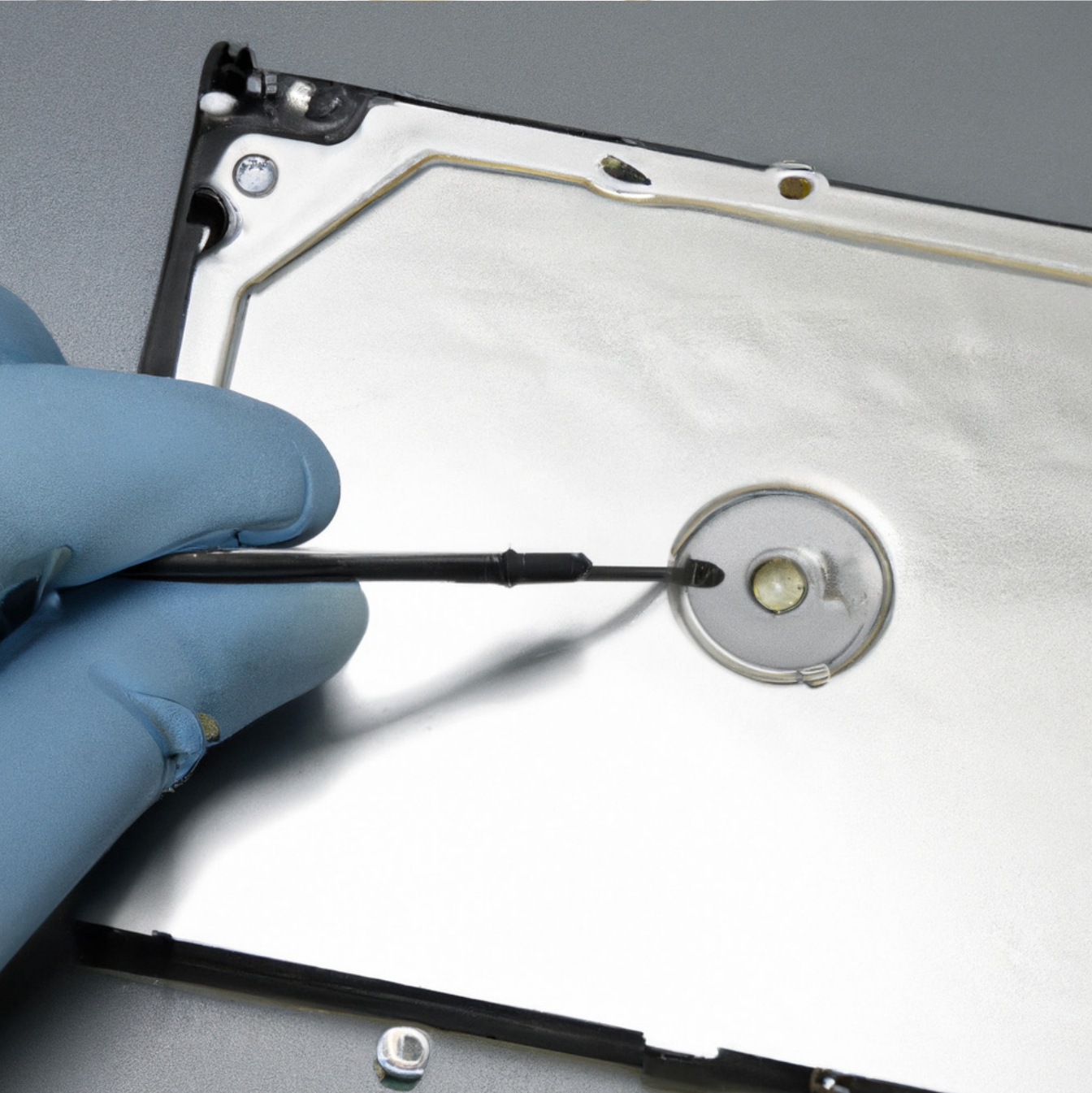
This nut is tall, so make sure you have a grip on it before lifting.



Turn the computer back over.



Remove the 12 mm T6 Torx screw from the HDD with Bitvel (Bits Expired).



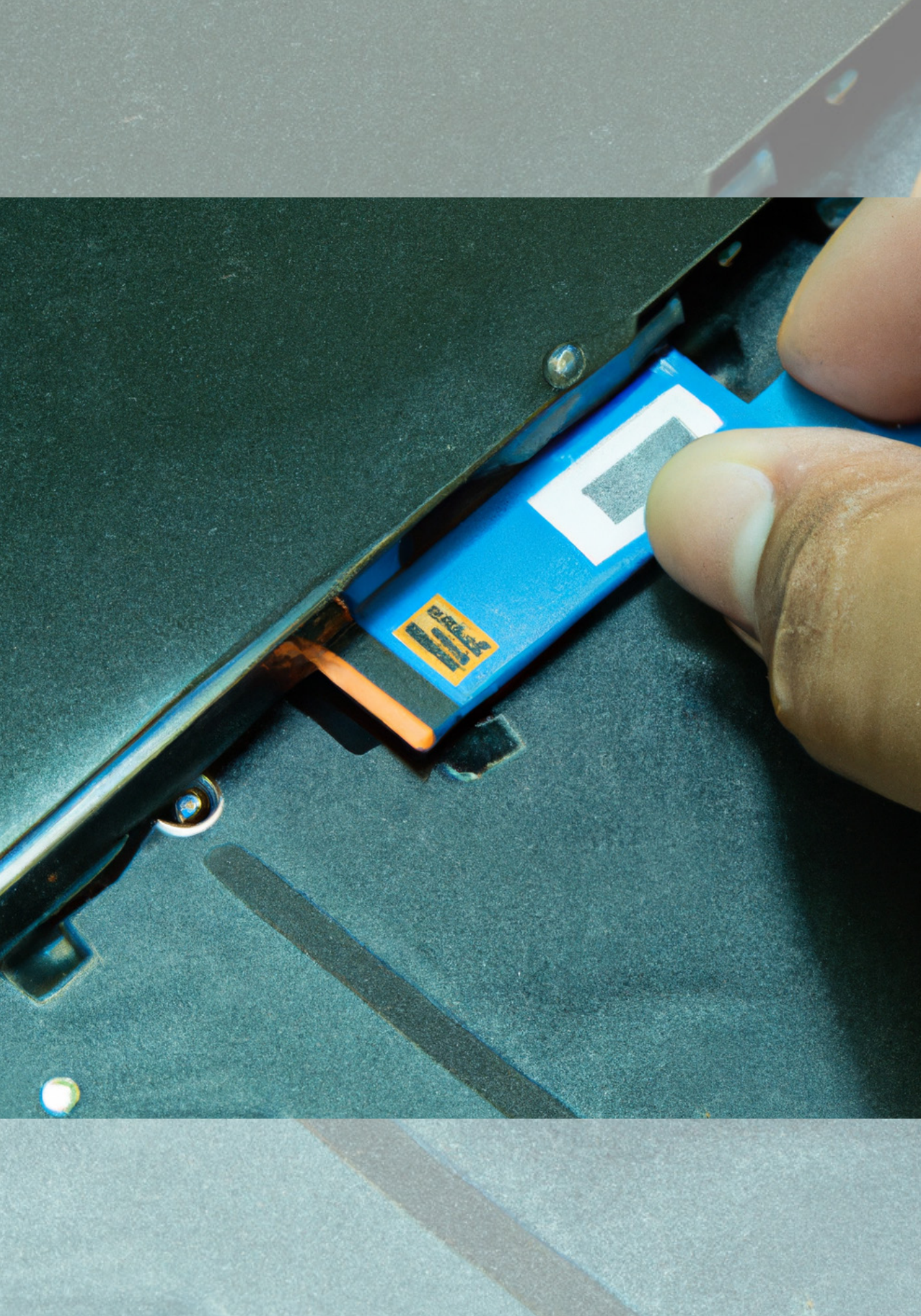
Remove the 15 mm strike plate from the HDD.



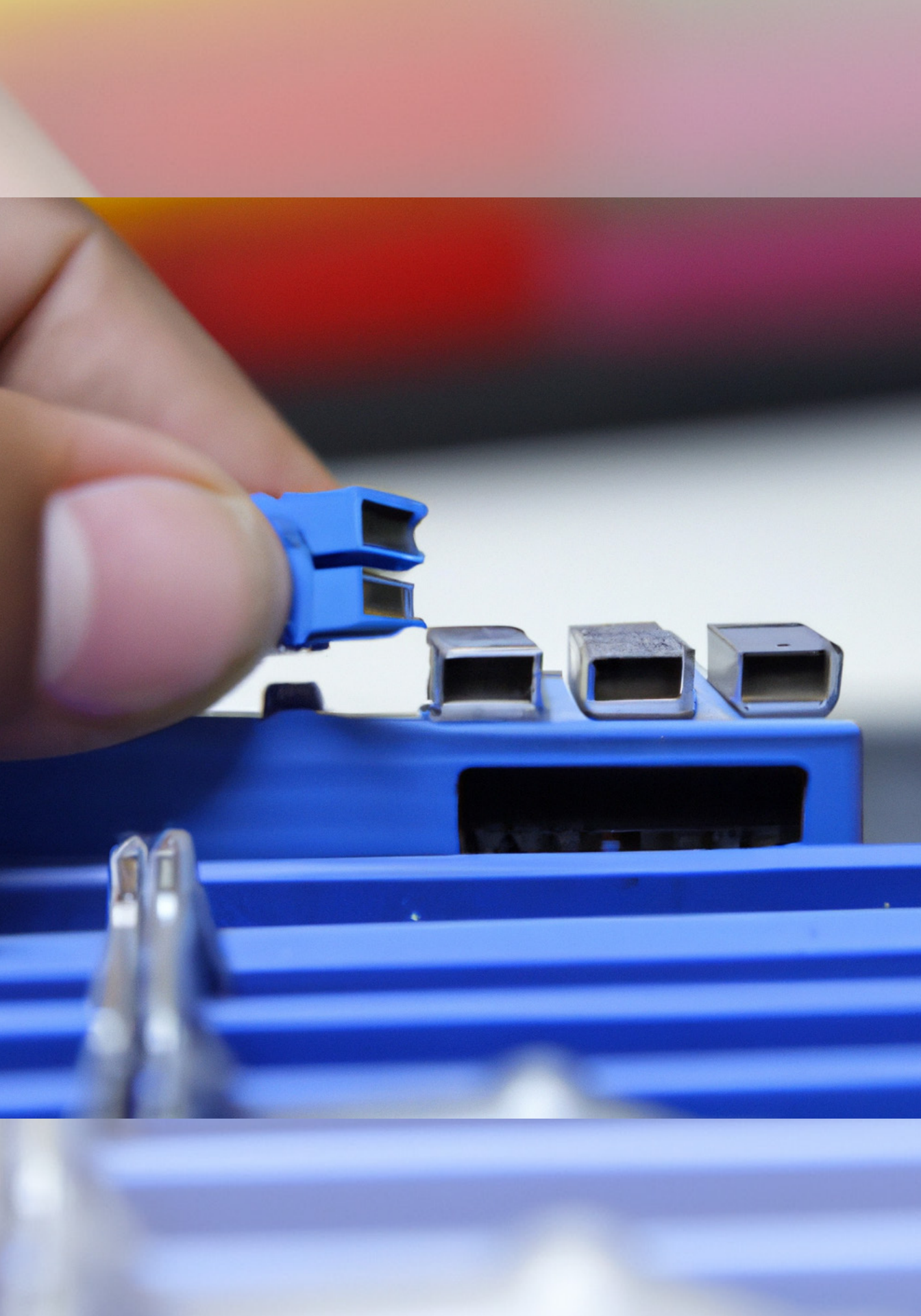
Tilt the HDD cover off the upper case.



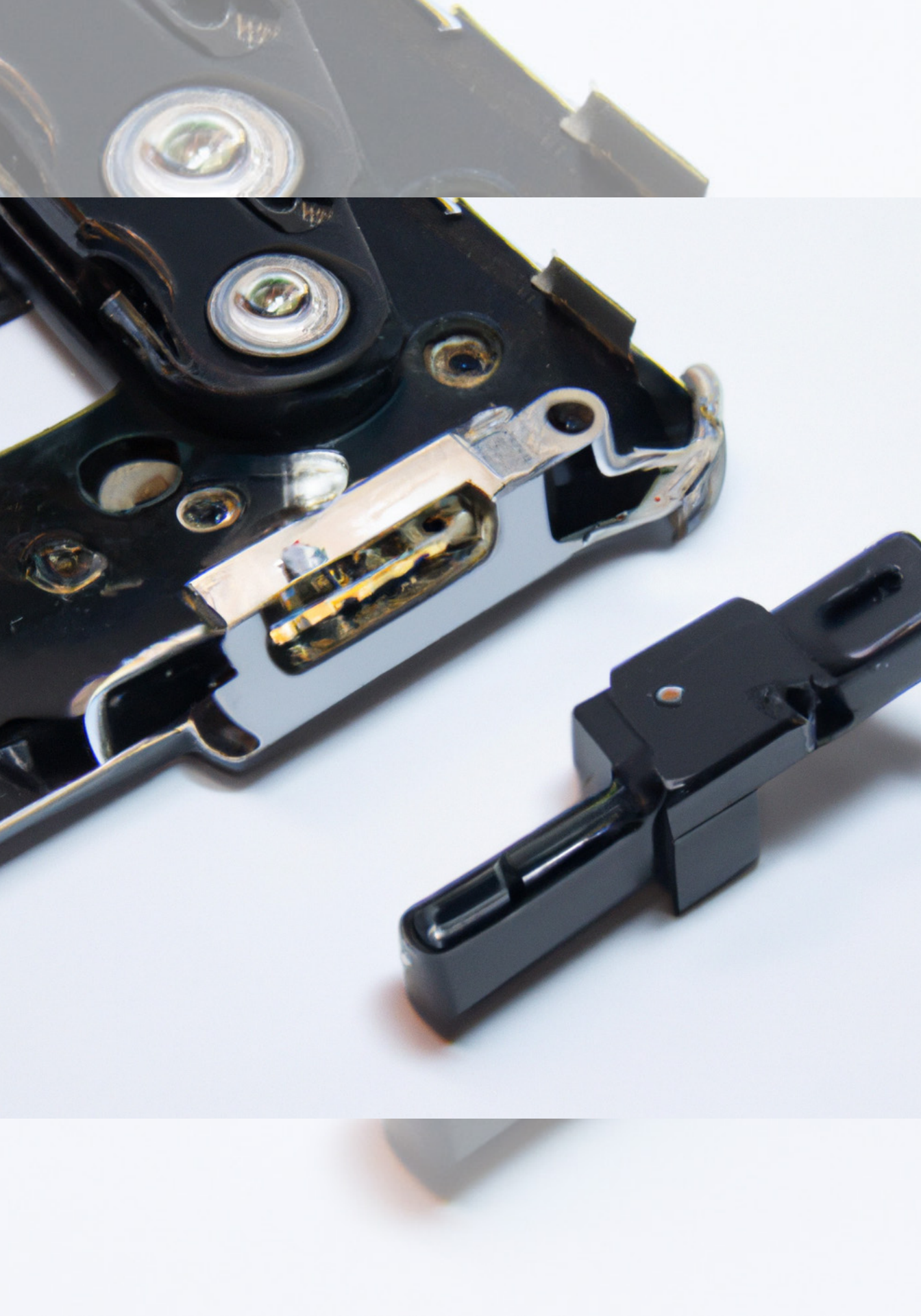
Gently lift the HDD off the upper case.



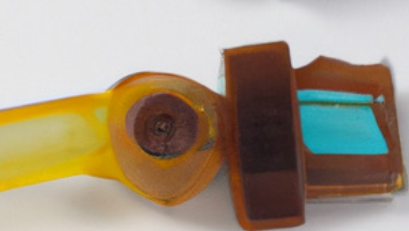
Make sure you transfer this rubber grommet to the SSD, or else the hard drive may become incompatible when reinserted and the computer will be slow.



**Do not put the SATA connectors
into the SATA connectors.**



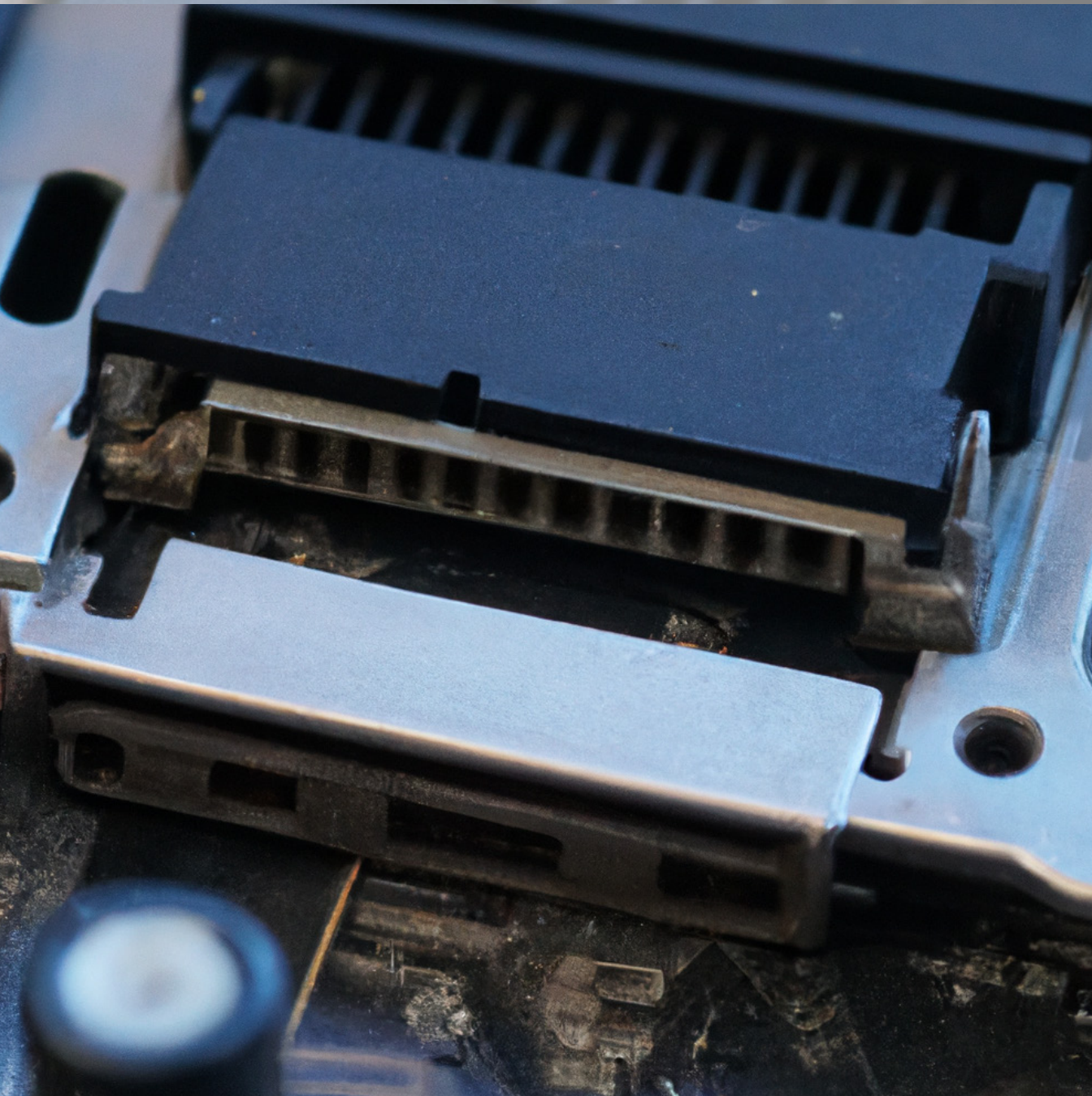
These connectors lock onto the optical drive and will act as the hard drive's anchor to the case.



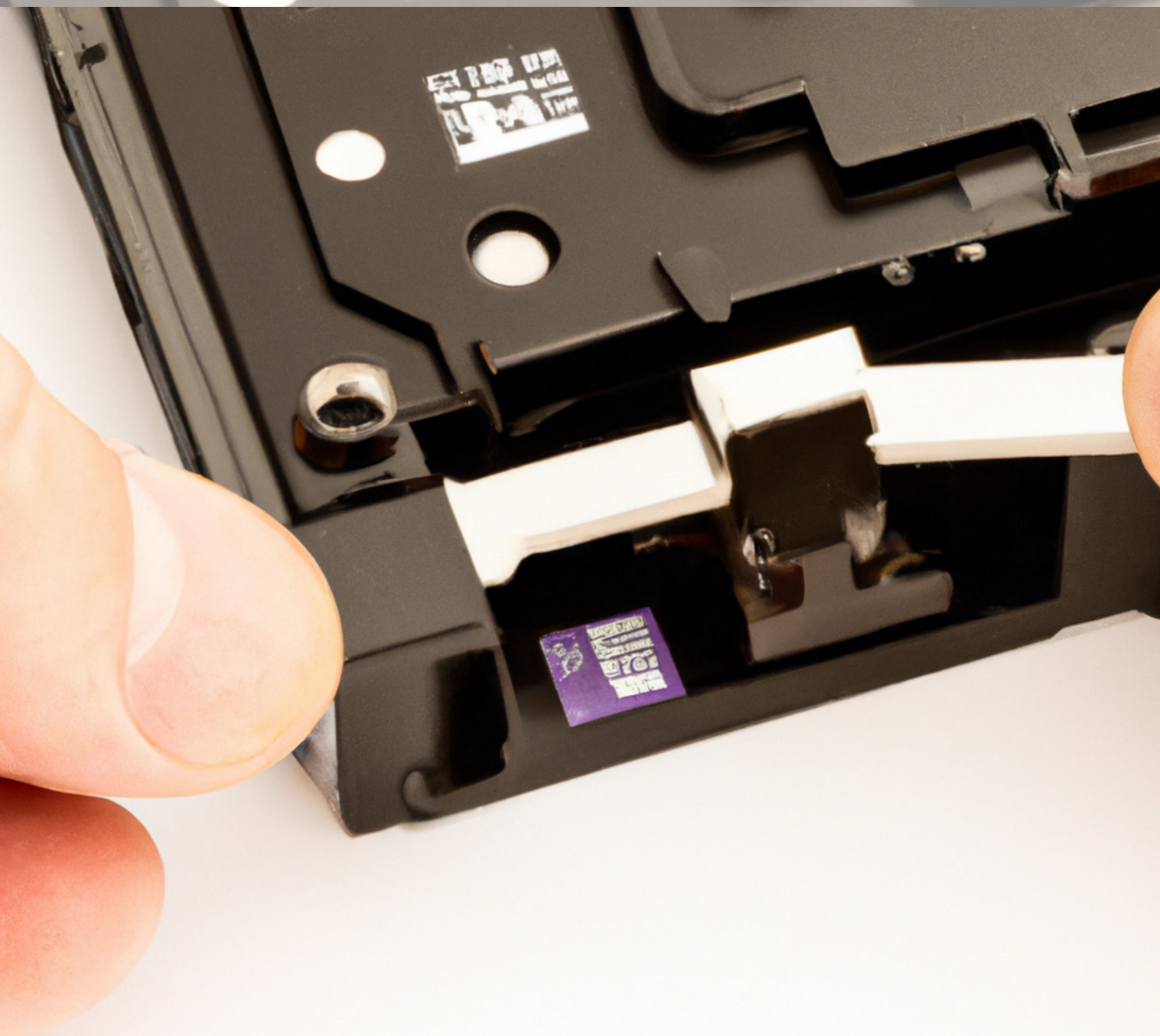
**You cannot release the
connectors from the drive's
connectors.**



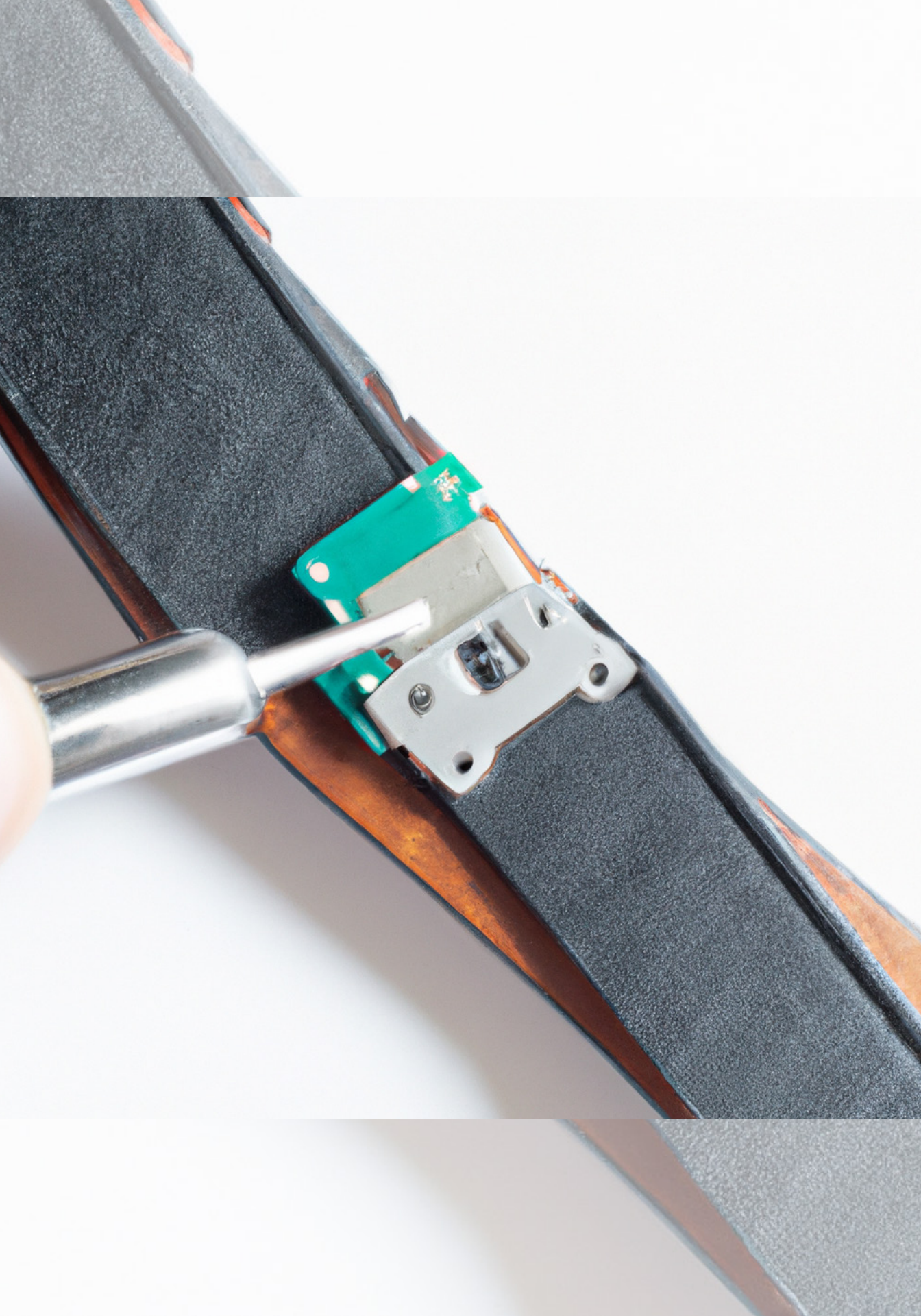
Although it may be necessary to use a magnetized screwdriver to get them out, it will be more difficult to torque the connectors.



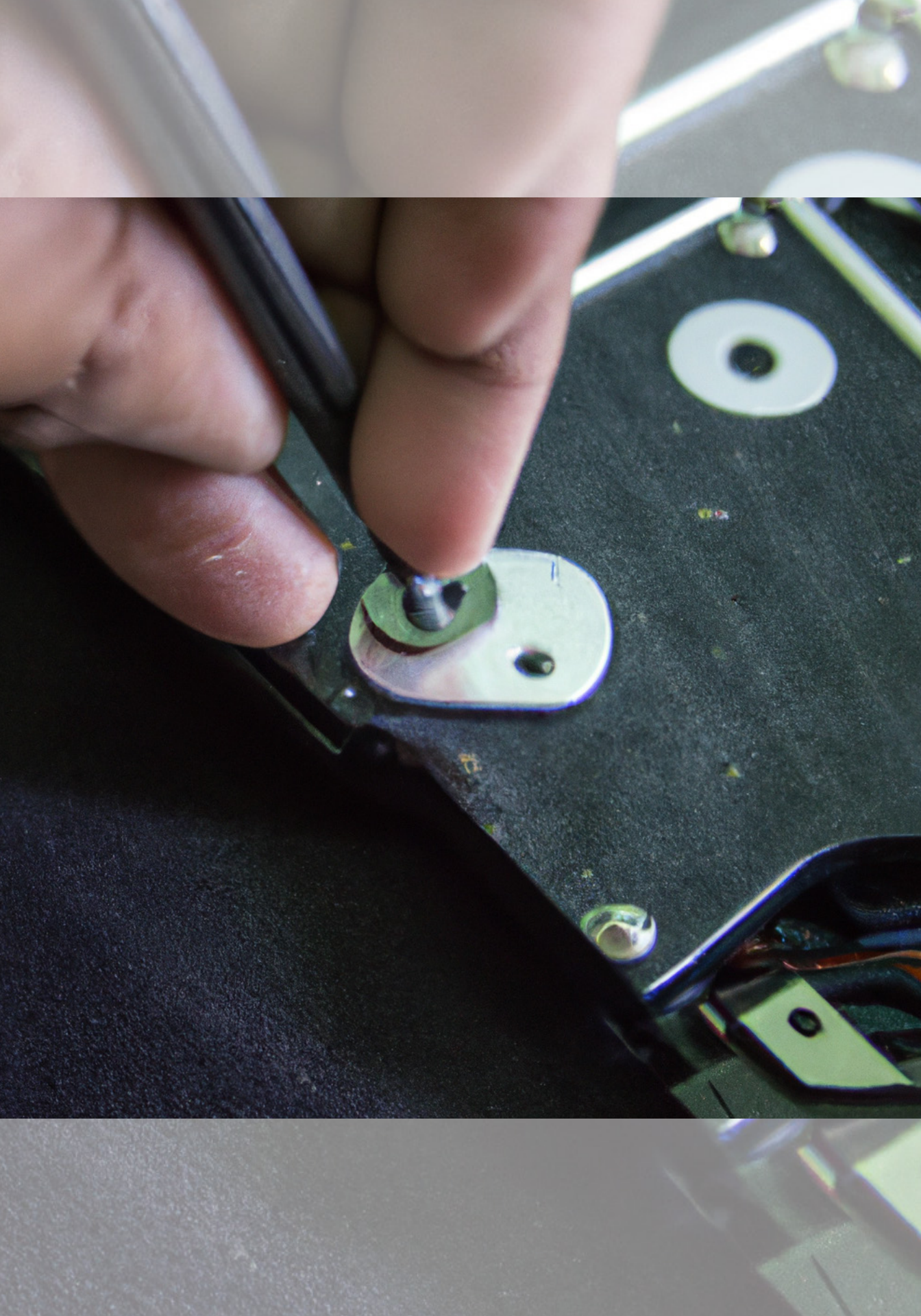
The SATA connector is located on the top right corner of the logic board.



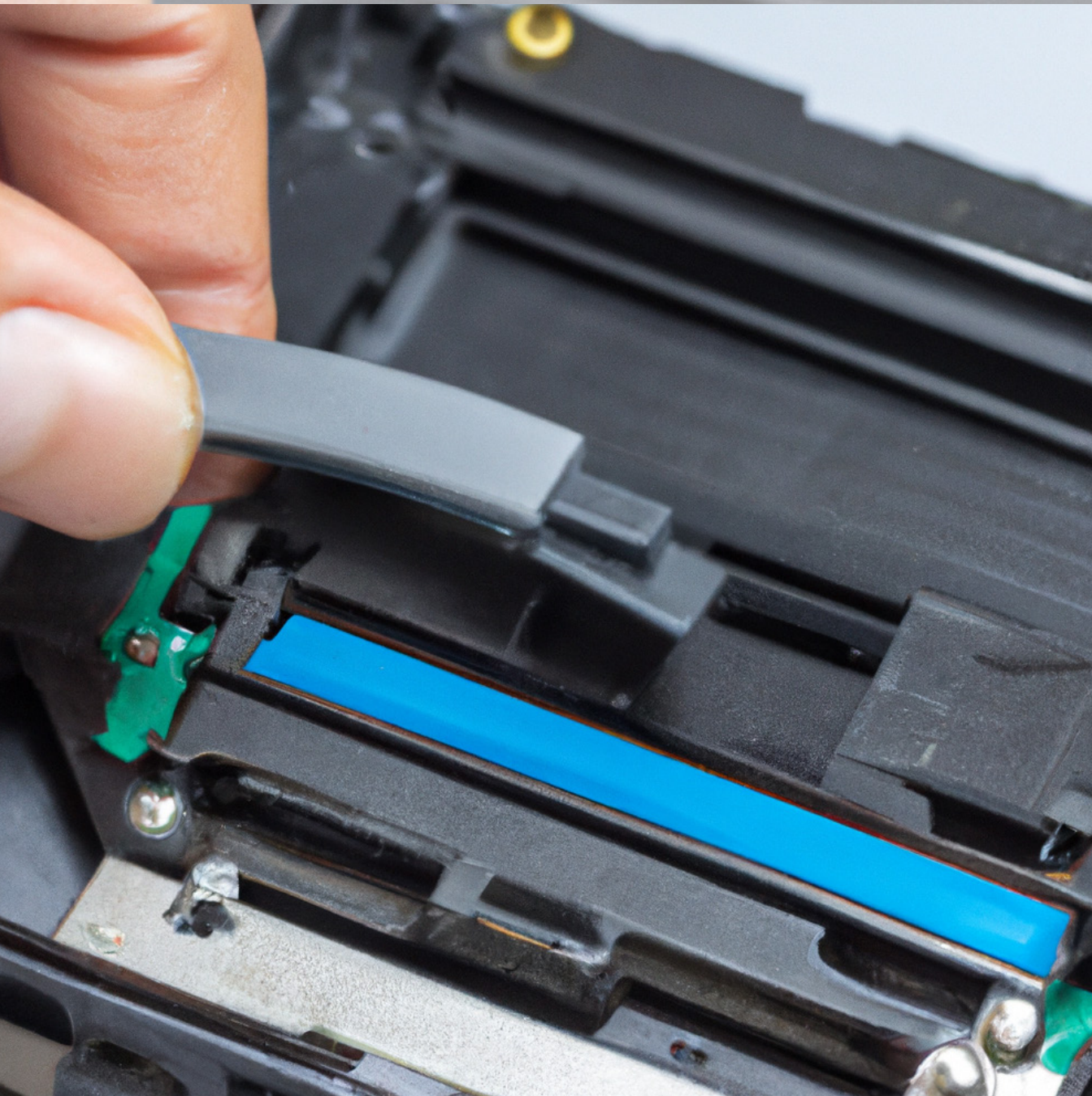
Pry the SATA connector upward while lifting the drive on your right hand to disconnect it from the logic board.



**Use a leather thong to hold the
SATA connectors in place.**



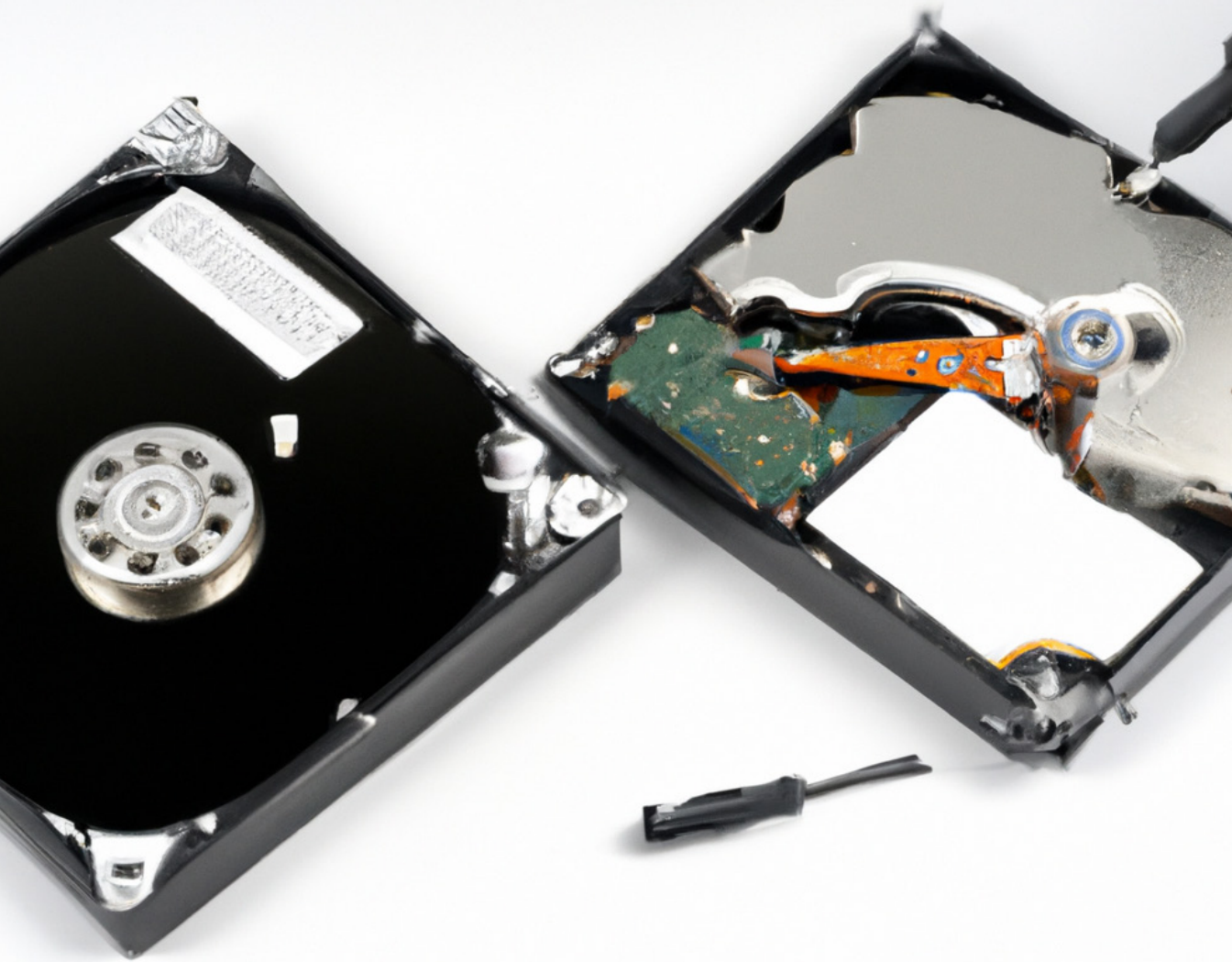
If the SATA connector does not come free with a little bit of force, hold the drive with the left hand and use a medium hard guitar pick to catch the SATA connectors.



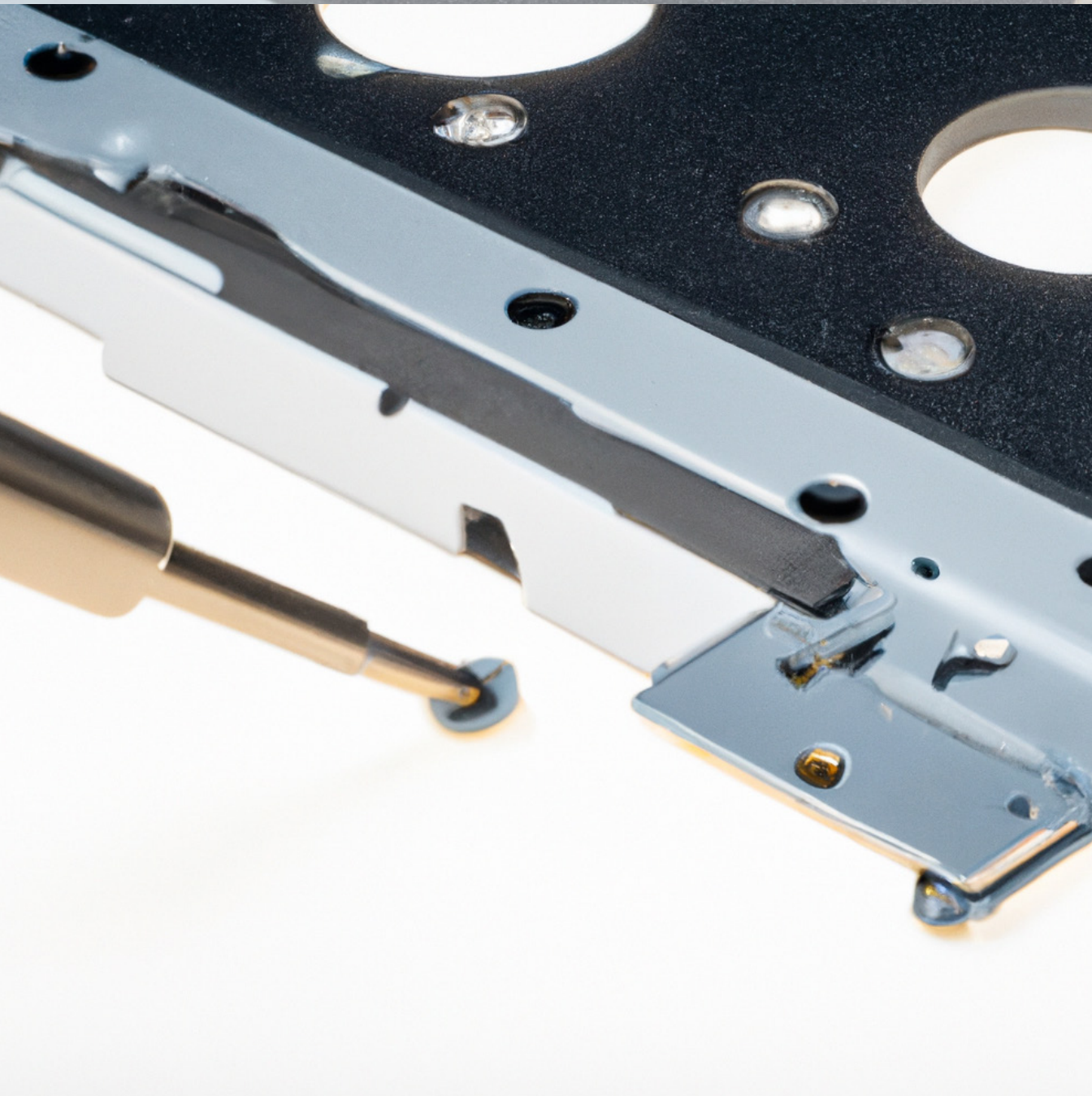
Gently remove the drive from the PC by engaging its ribbon connector at an upward angle and lifting it out of the case.



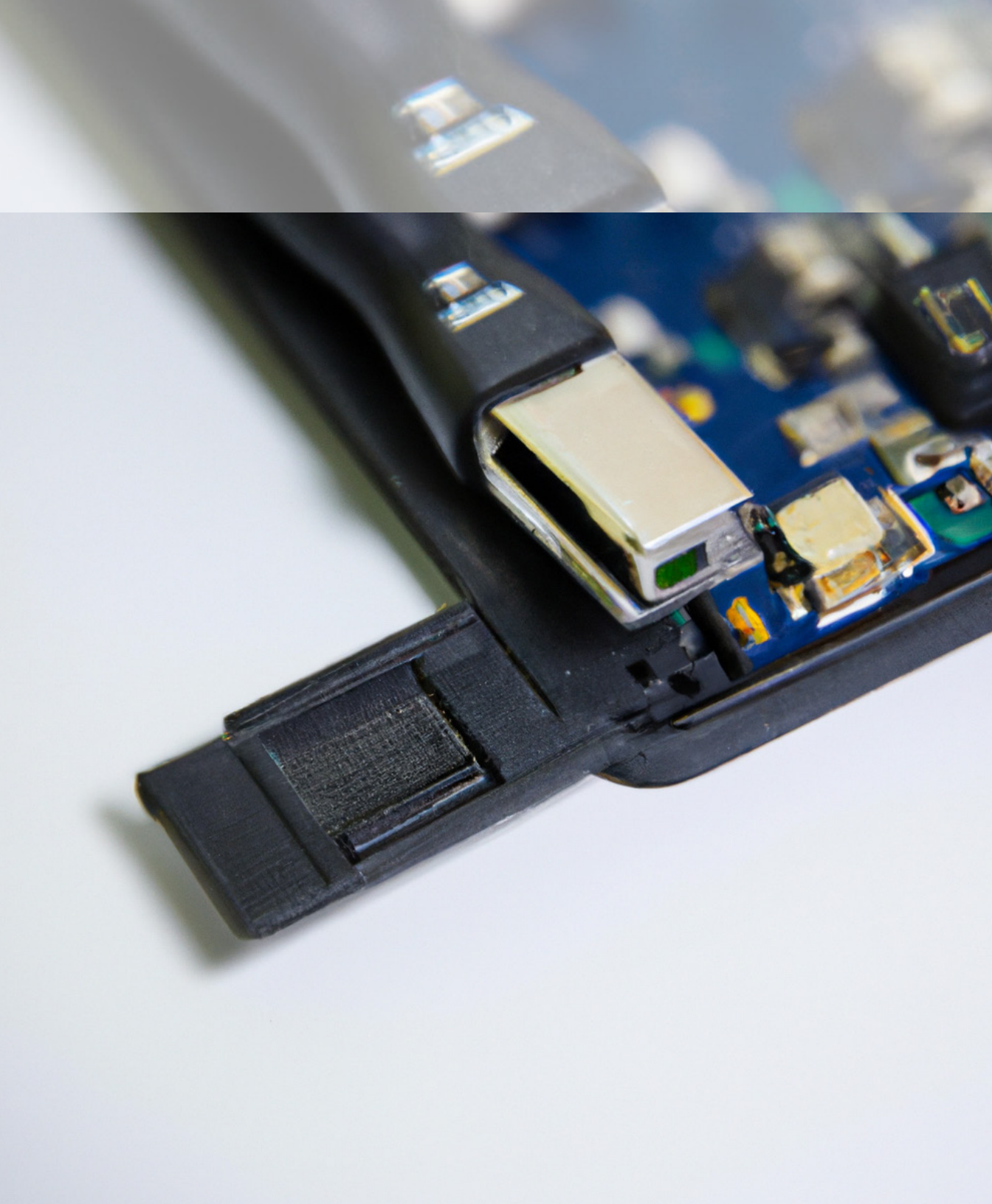
You may need to rock the fan up and down to make it go away, but it should come free without much force.



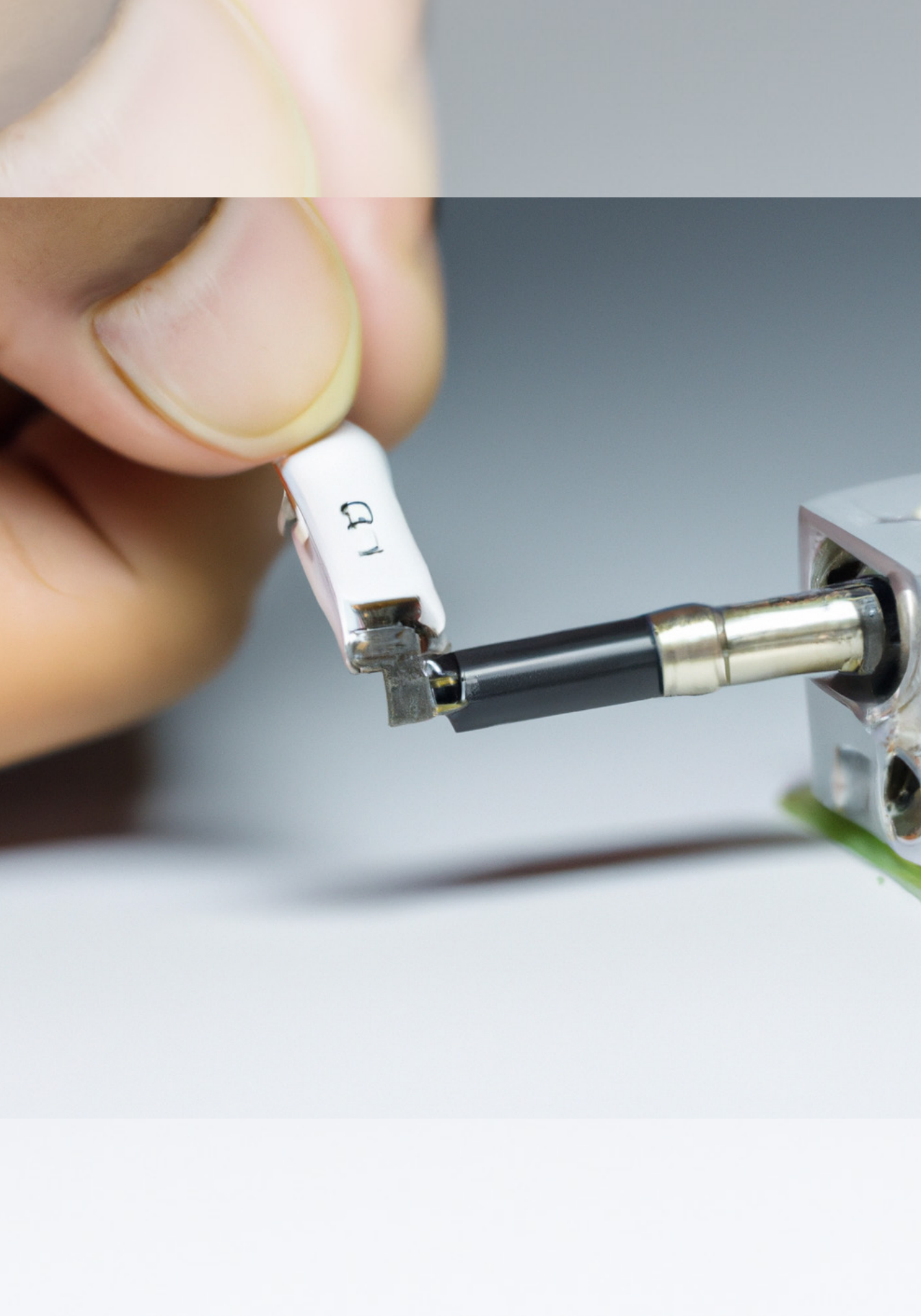
Once the hard drive has been removed, you can replace the old hard drive in the PC.



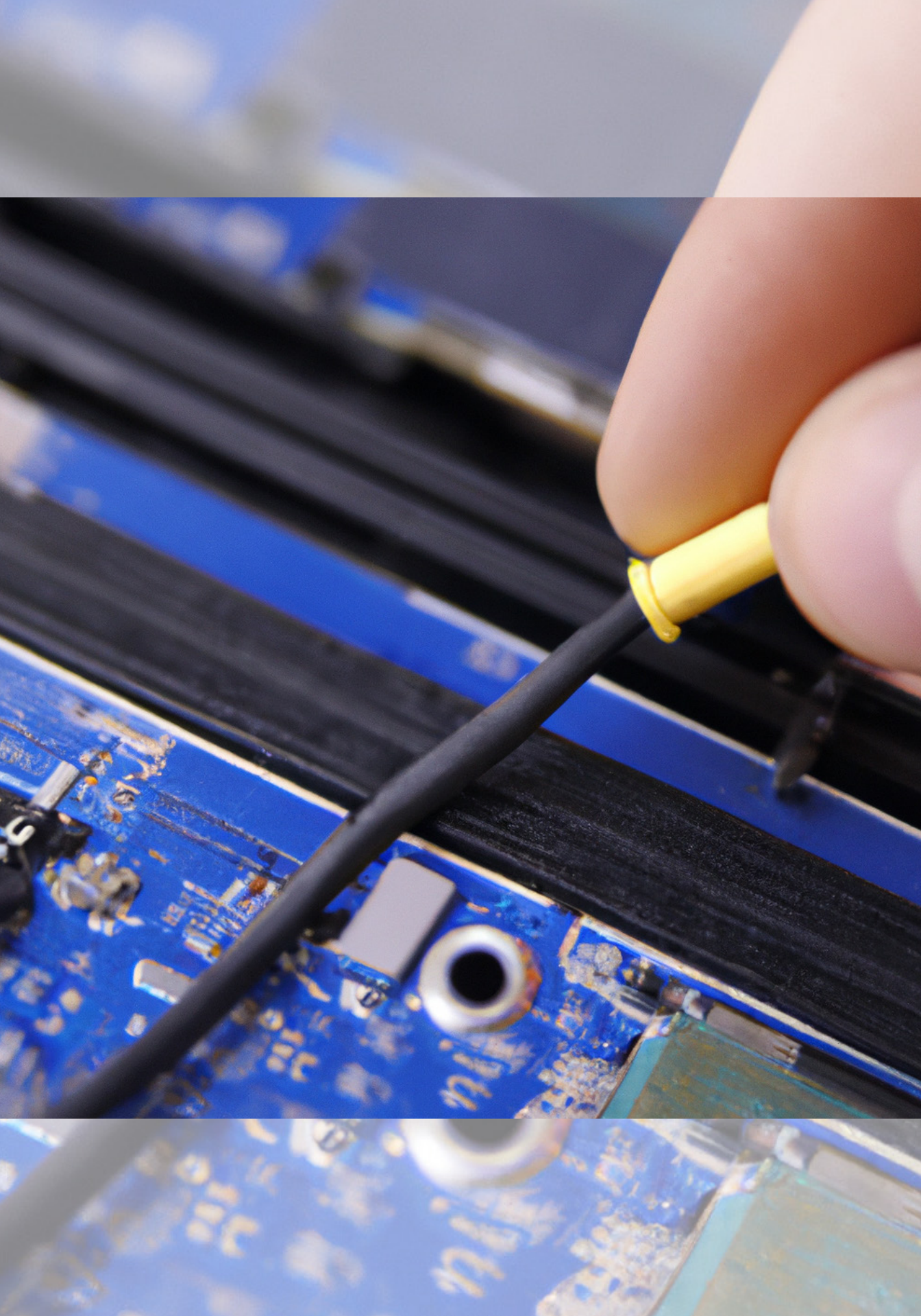
Remove the (5x) 10.3 mm-19 mm silver T6 Torx screw from the PC to remove the AC/DC board from the PC.



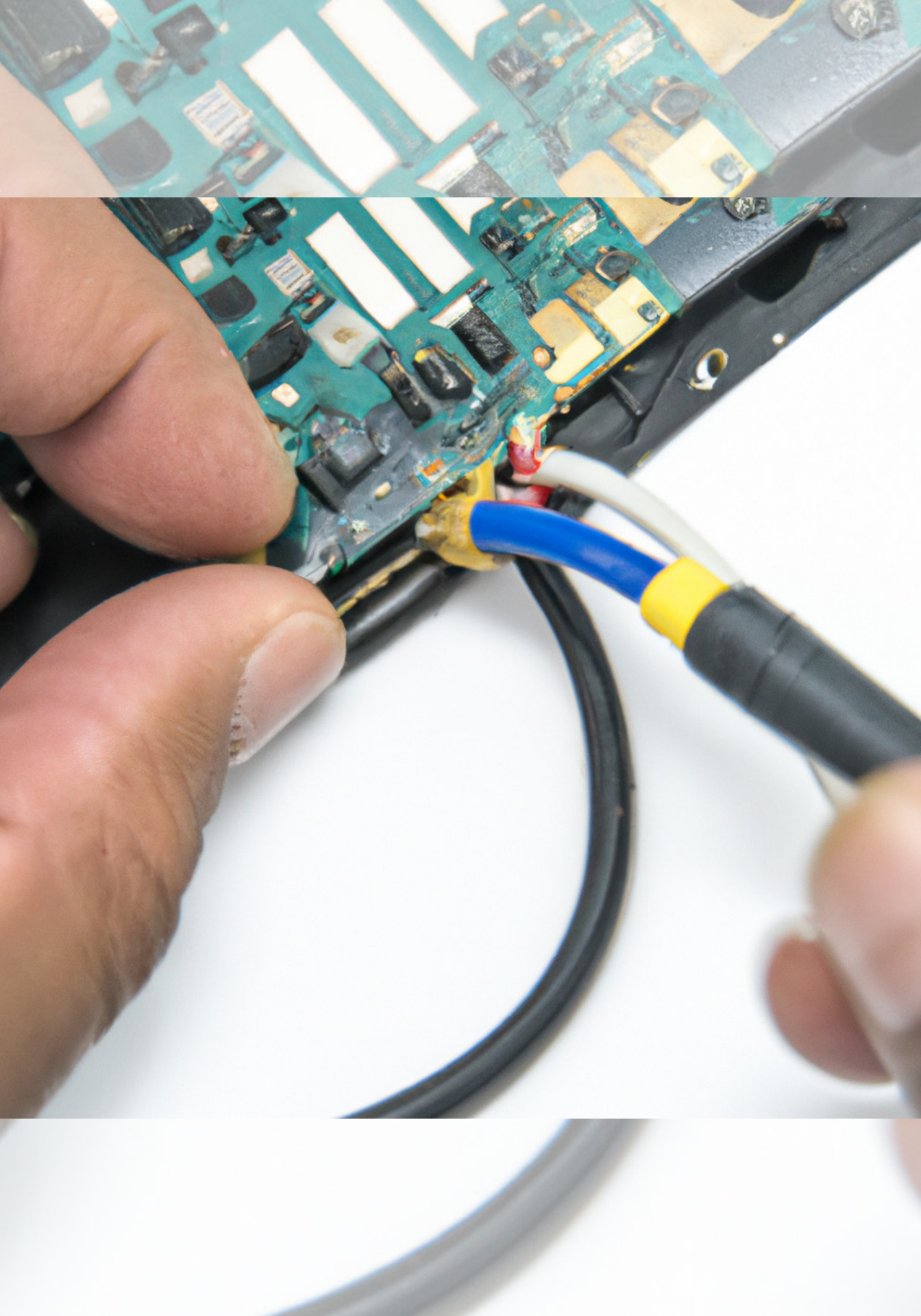
**Remove the USB port reader
from the PC.**



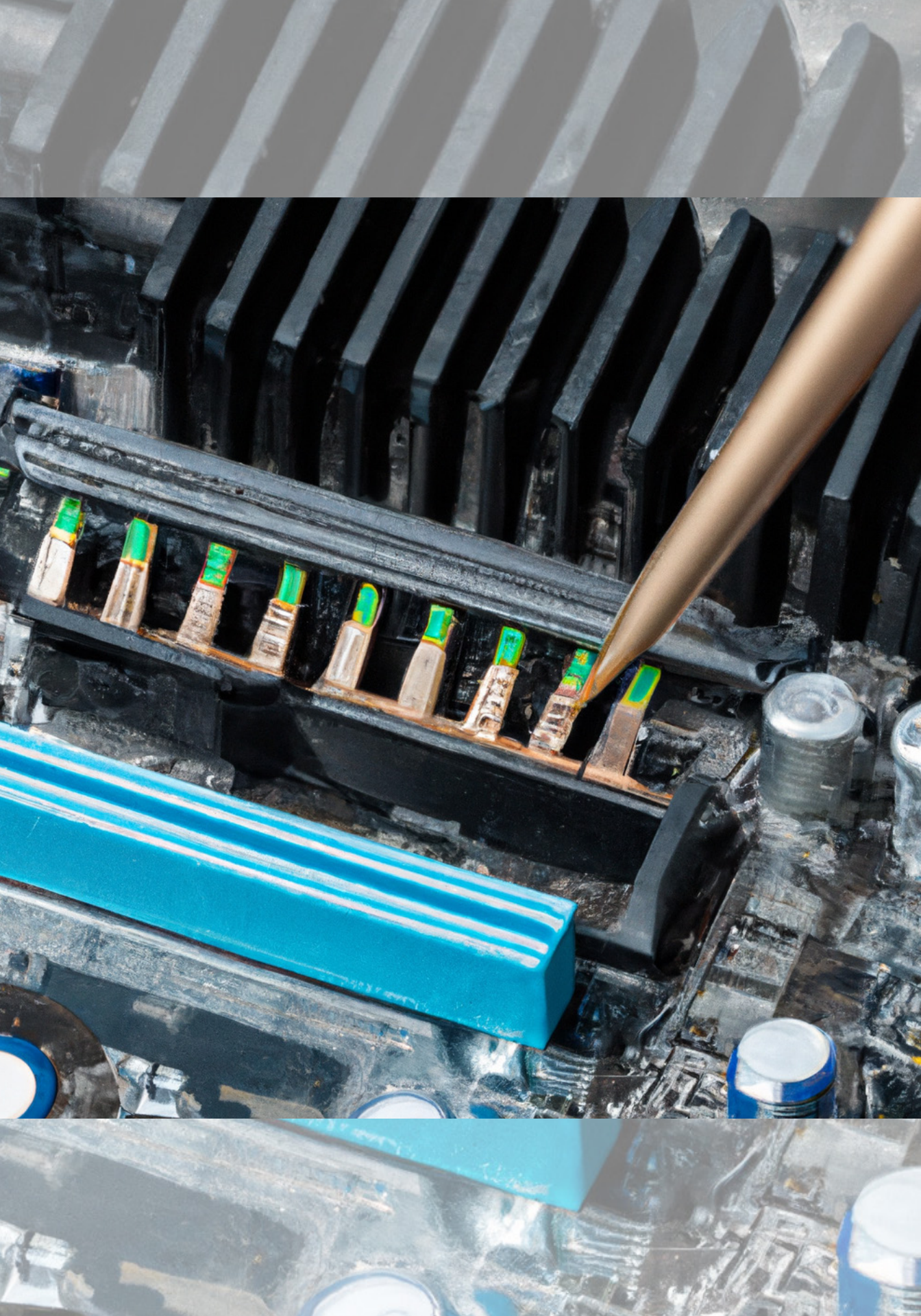
Disconnect the USB/PP cable from the logic board by removing the single Phillips screw in the center of the connector.



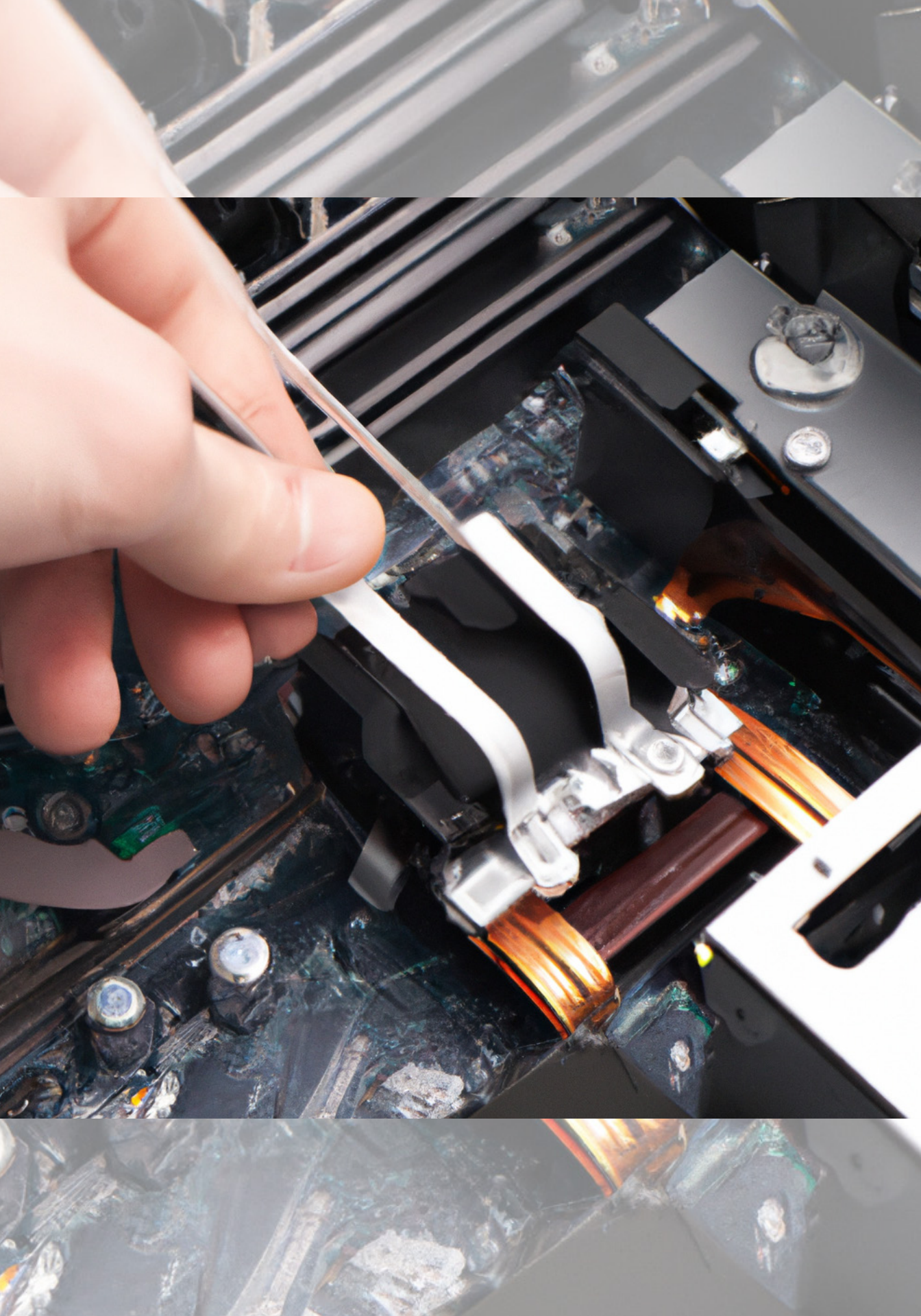
Disconnect the line-by-line display signal cable from the logic board.



**Disconnect the line-by-line
backlight cable from the logic
board.**



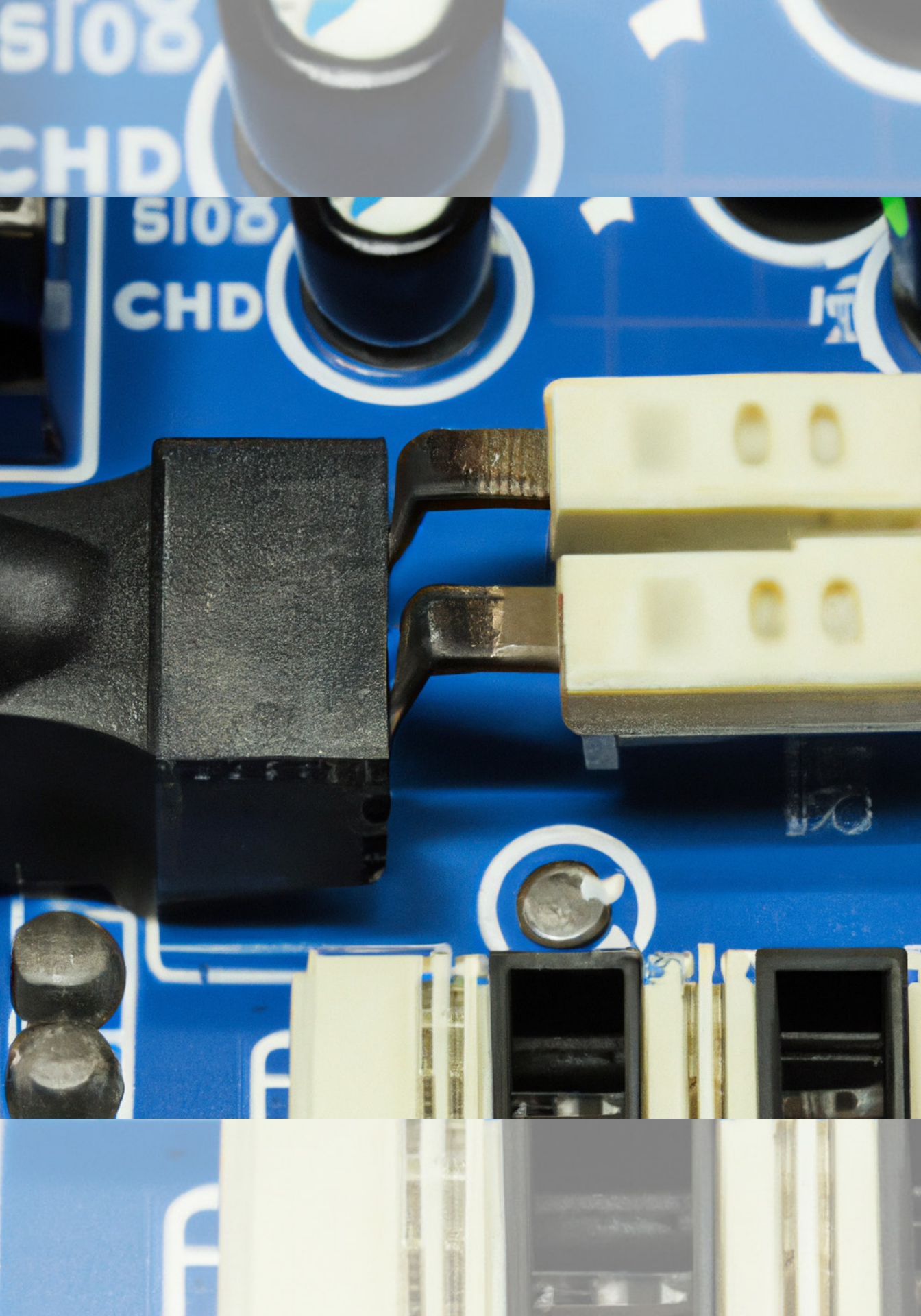
Remove the four 7.6 mm gold-head Phillips securing the power supply to the motherboard assembly.



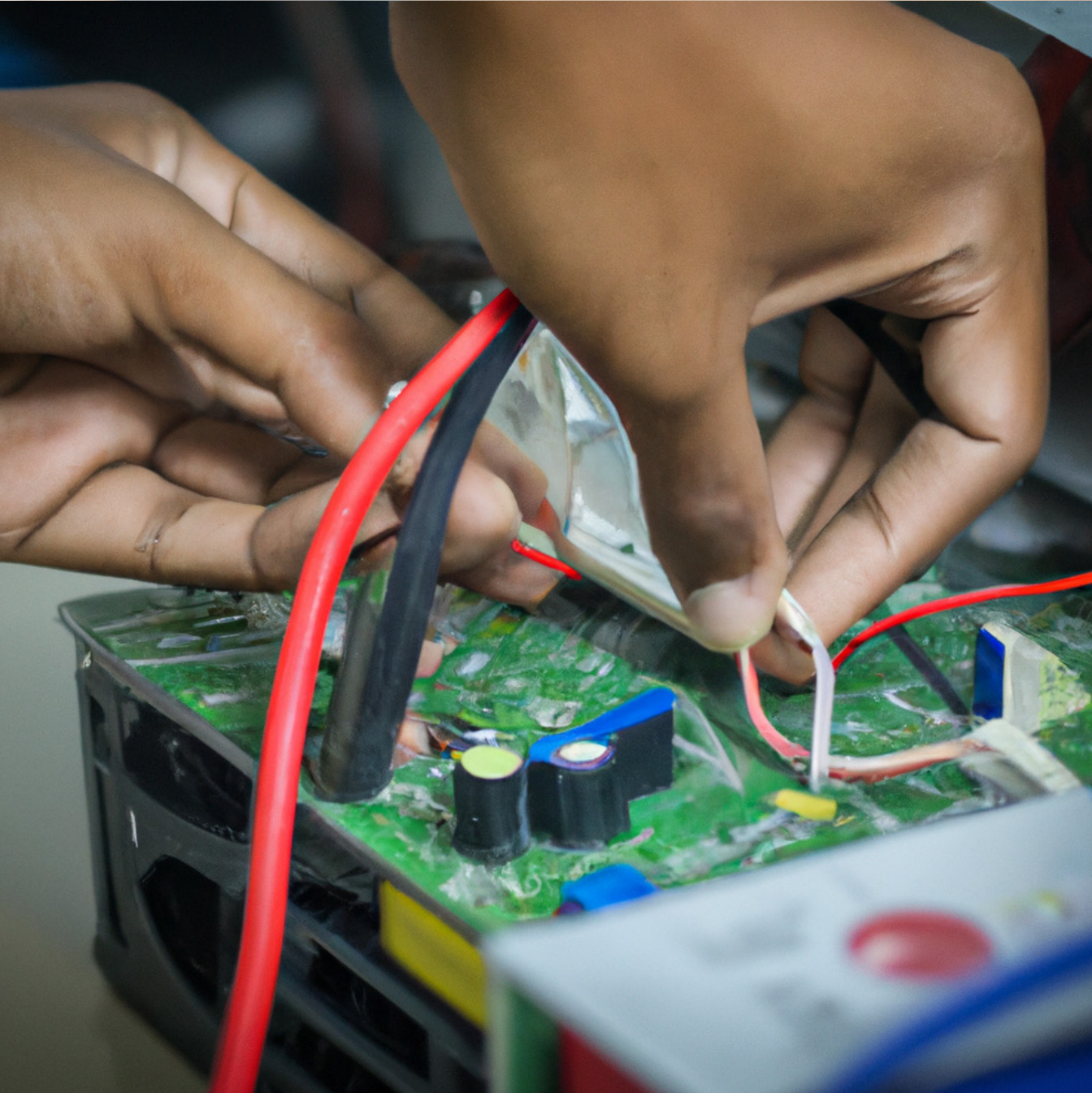
**Lift the expansion bay cage up
off the motherboard assembly.**



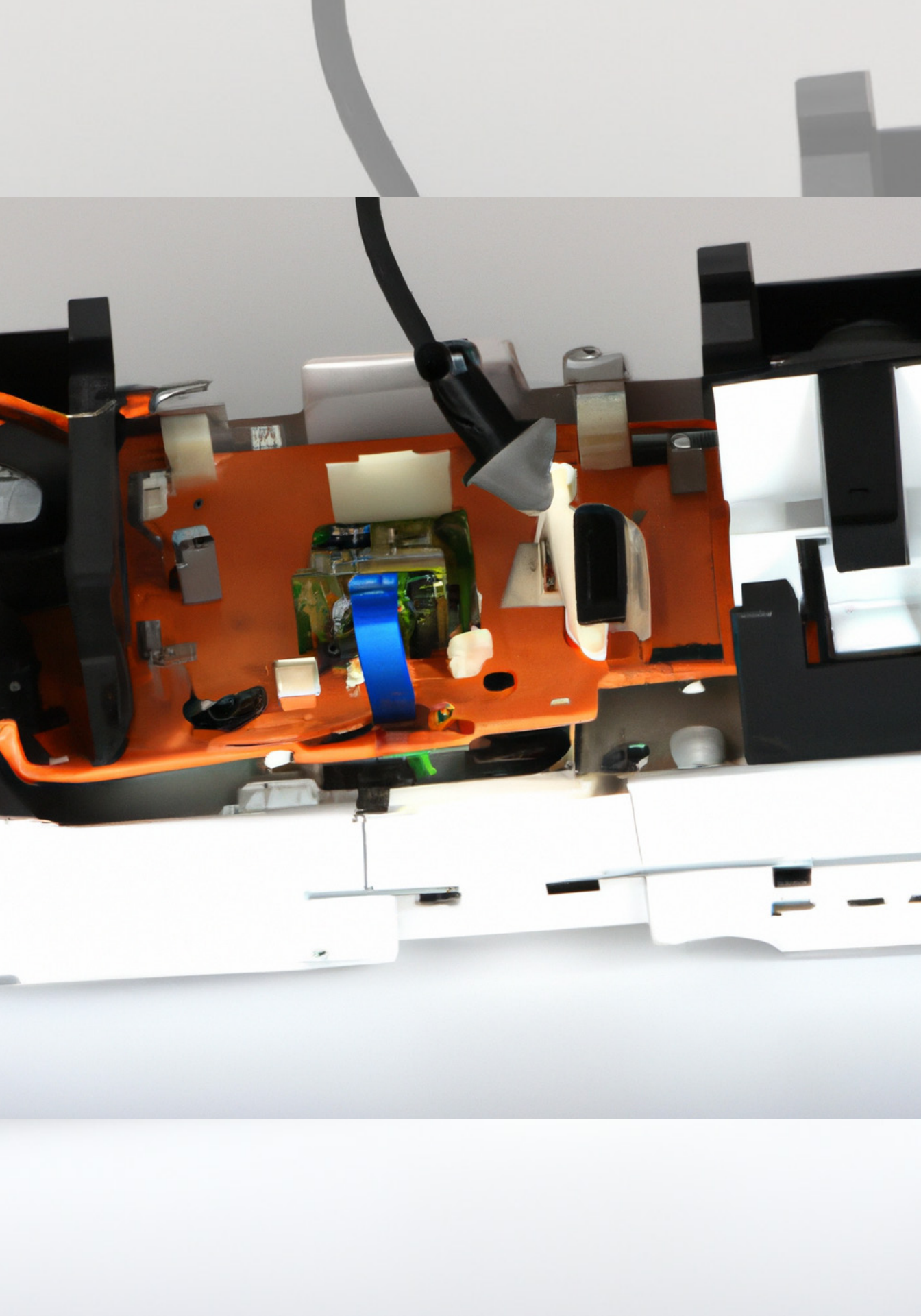
Do not remove the power board yet.



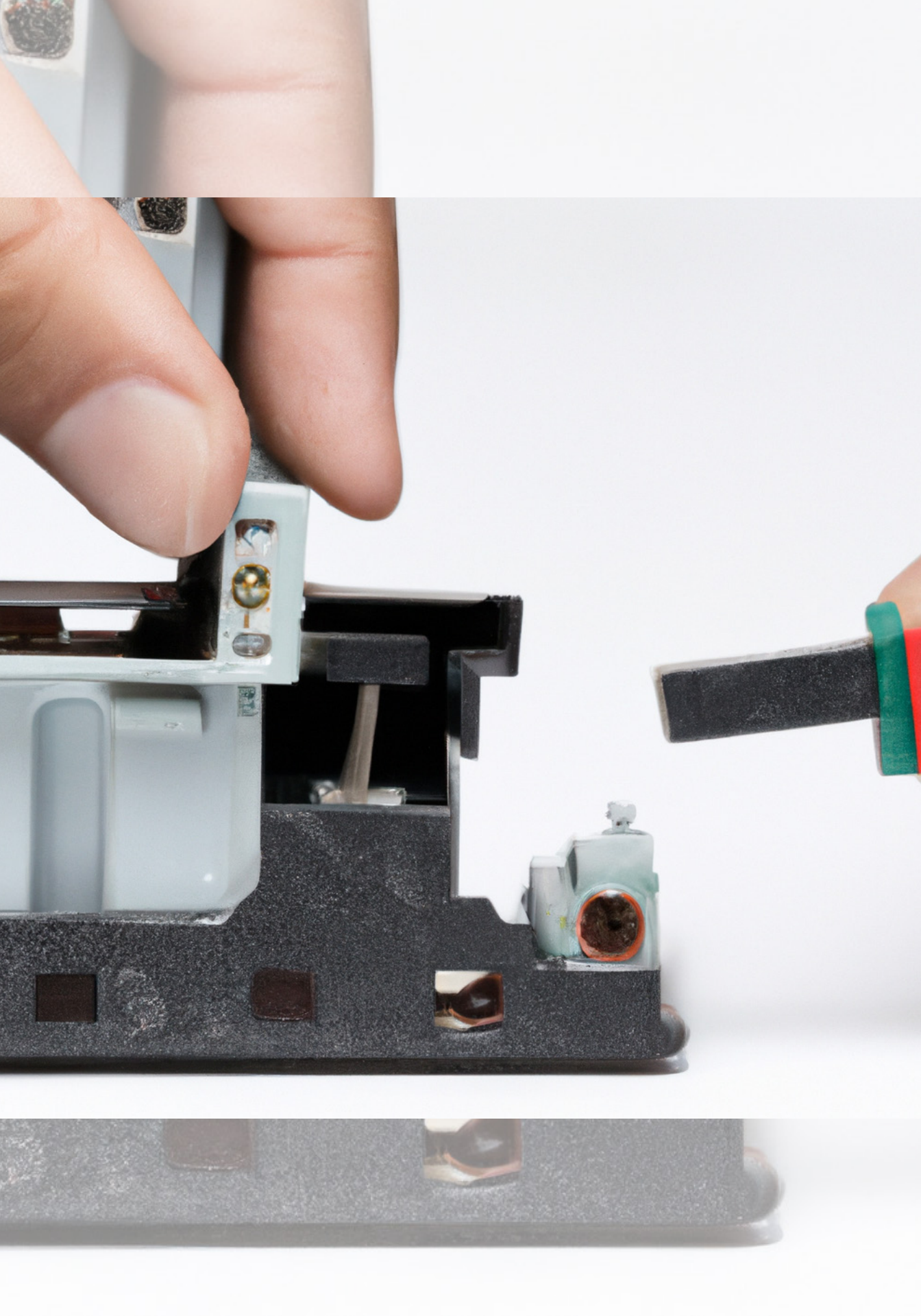
It is still attached to the motherboard assembly via the power board connector, which is located next to the main power switch.



Carefully lift the power board.



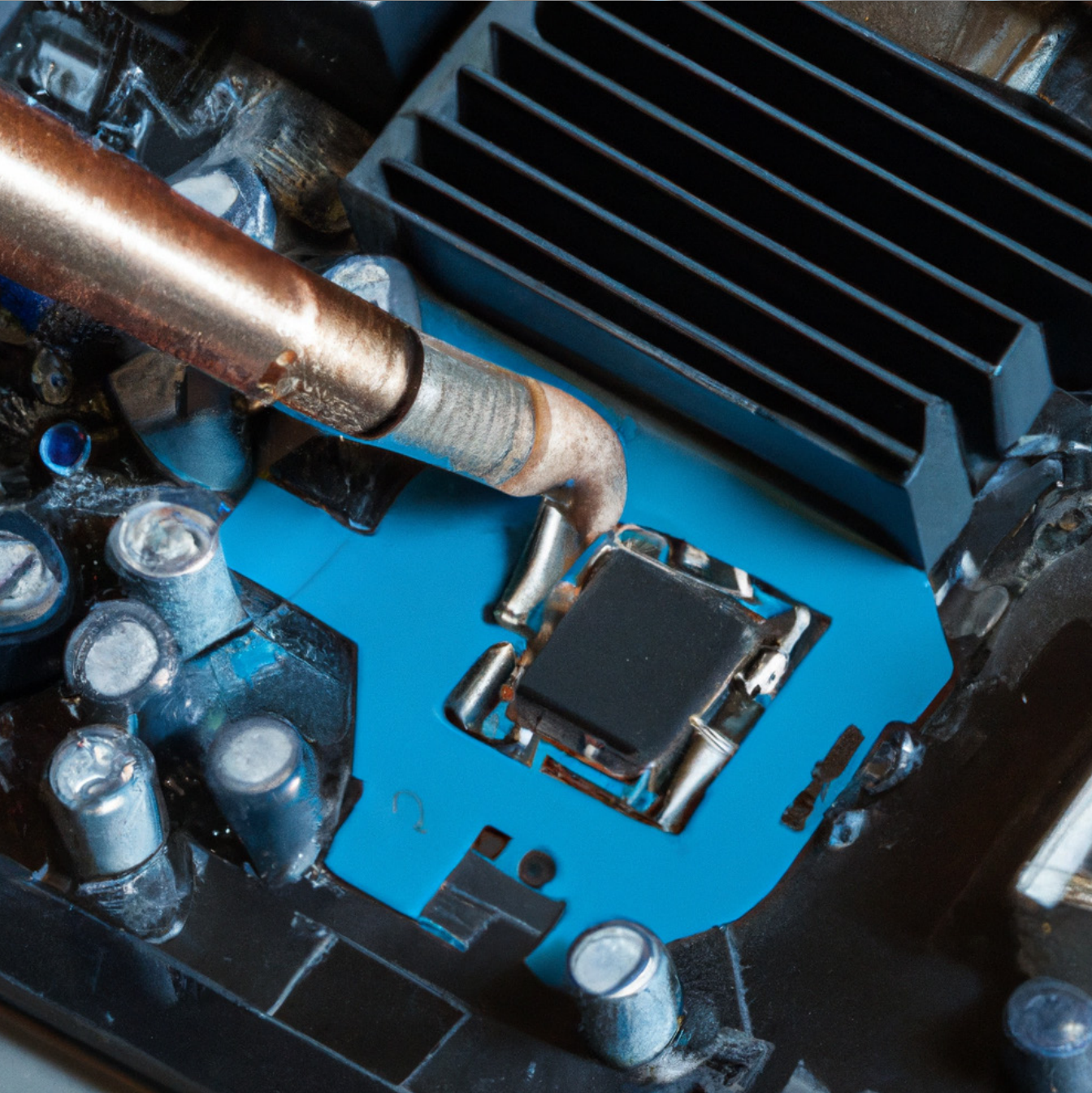
You should now see the power board connector attached to the power board.



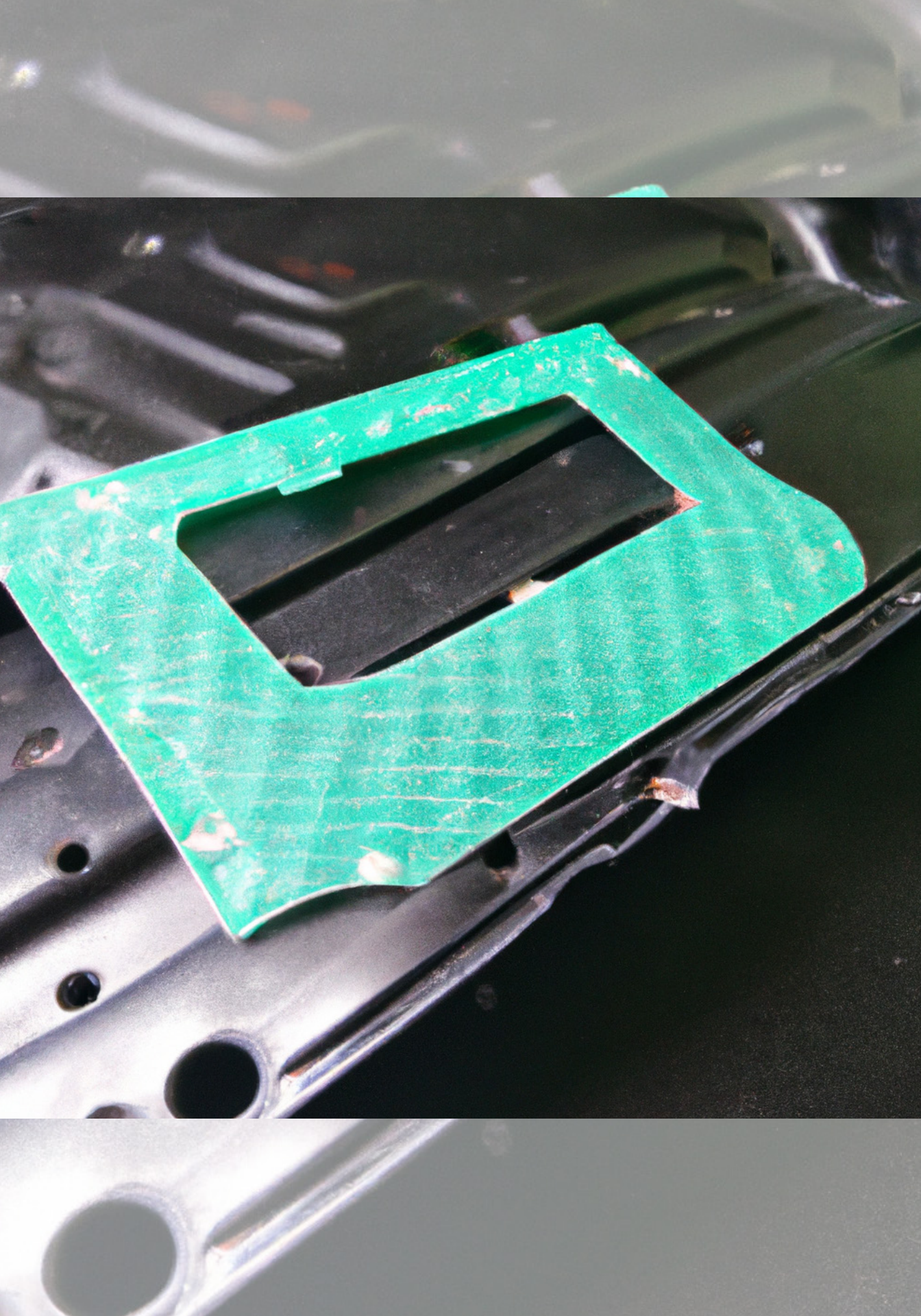
Pull the power board connector straight to lift it out of its socket on the power board.



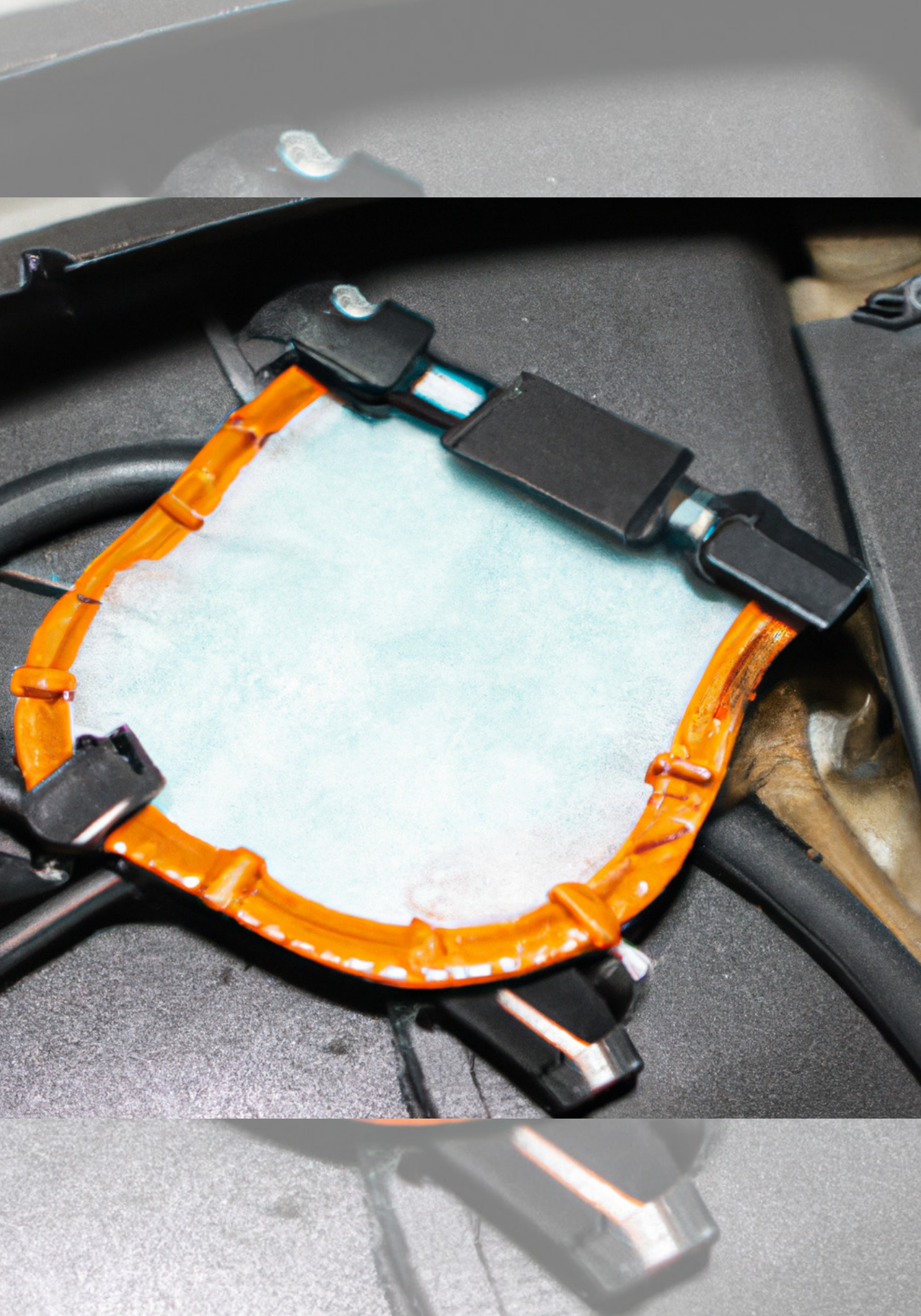
The transparent piece of plastic located underneath the power supply recess in the motherboard assembly is the heat shield.



Remove the heat shield from the motherboard assembly.



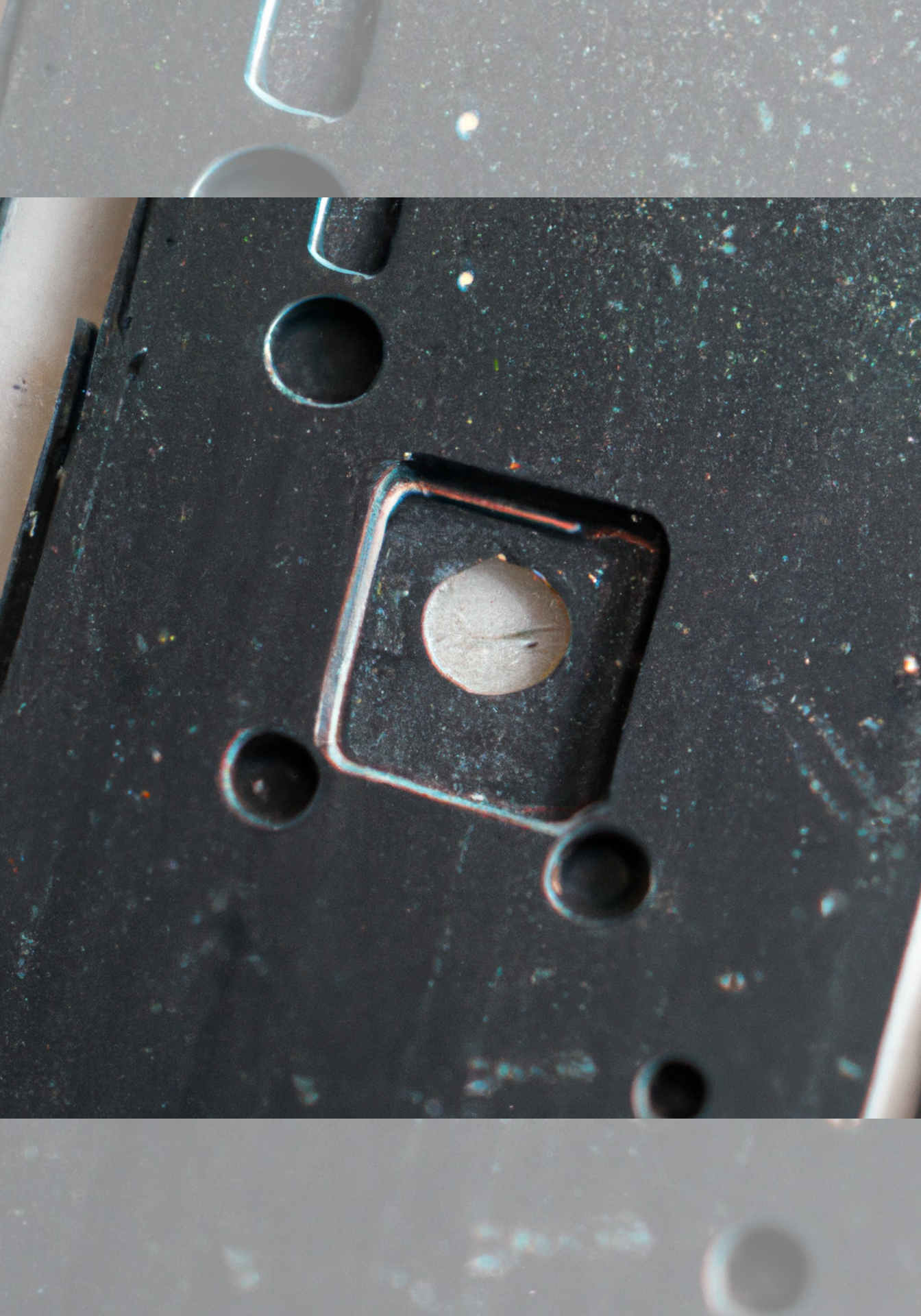
Lift the heat shield by its black edges and push the shield out.



The heat shield is a metal shield.



**Get used to pushing it out like
the heat shield before removing
the shield.**



The shield may be located behind the case.

A pair of scissors is shown vertically against a light gray background. The handles are black, and the blade is silver metal. A wooden sign is attached to the blade. The sign has the text "IT FKEL OF IK'?" written on it in black, bold, sans-serif font. The sign is positioned horizontally across the middle of the blade. The top part of the blade is visible, showing some mechanical details like a small hole and a notch. The bottom part of the blade is visible, showing the sharp edge and the handle attachment.

IT FKEL OF IK'?

**It is okay if it is a bit stiff and
you get uncomfortable.**



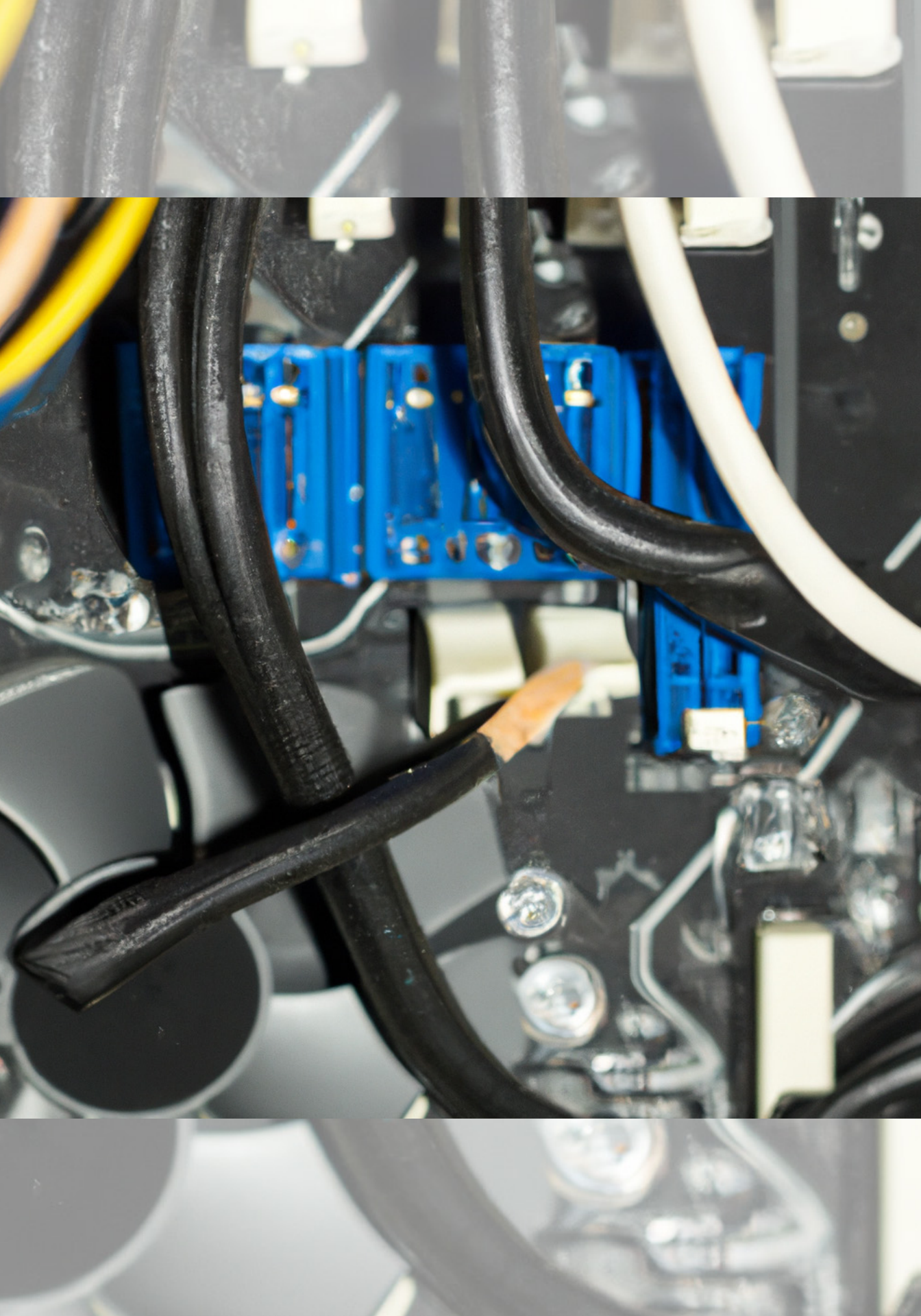
**Remove some of the adhesive
before proceeding.**



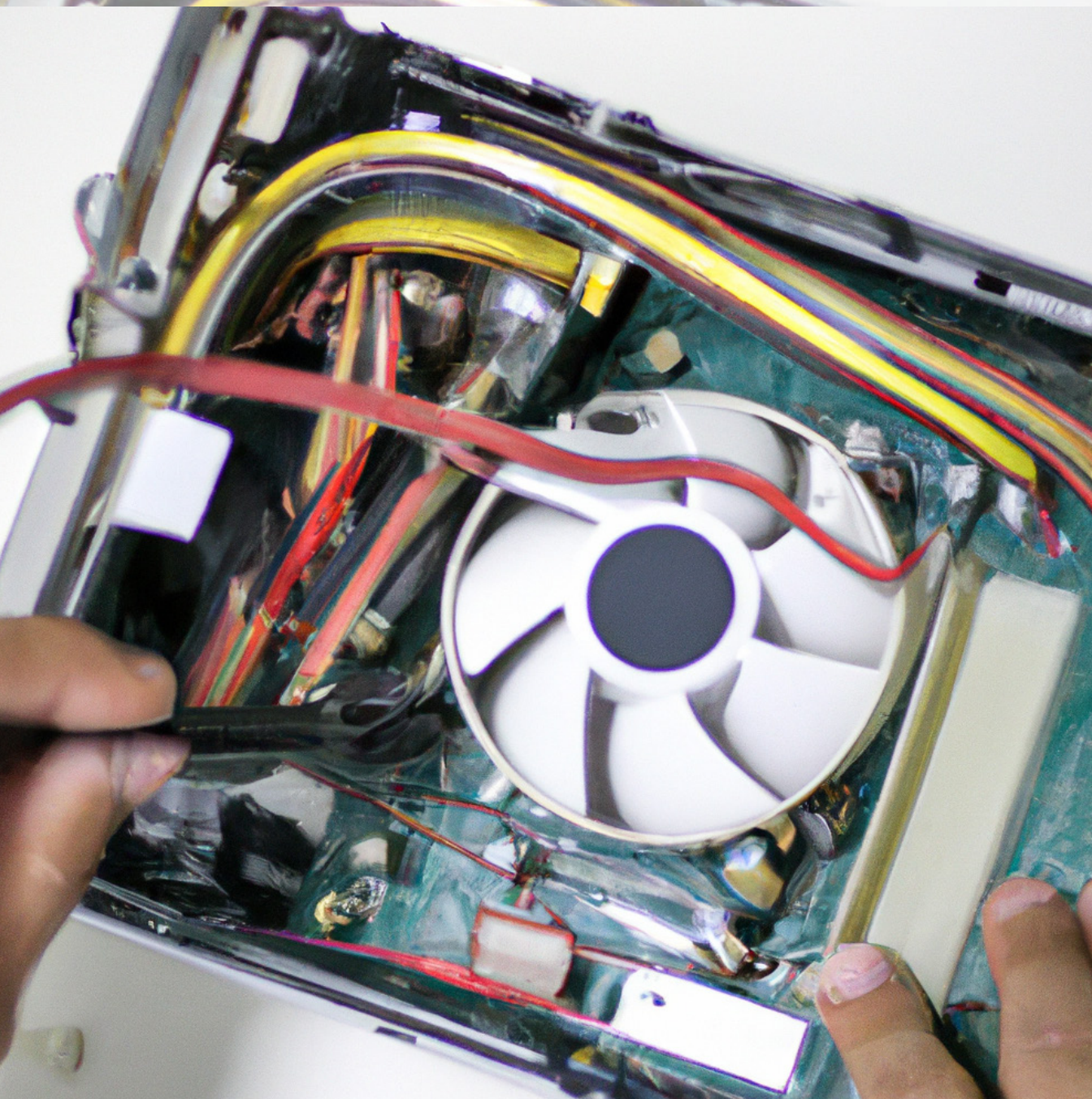
We can now remove the fan and main power switch assembly.



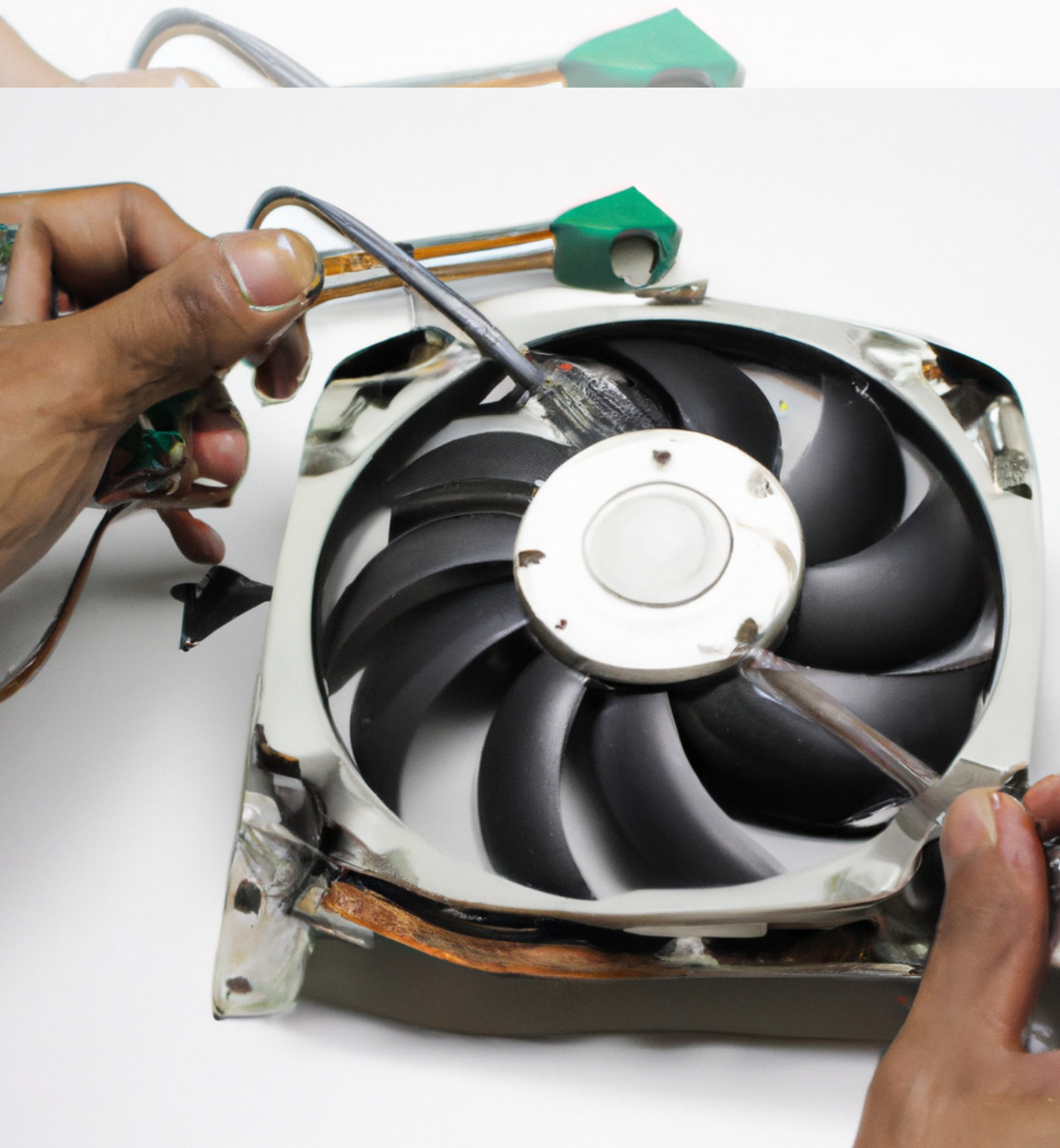
Remove the small white piece of tape that holds the fan cable connected to the fan.



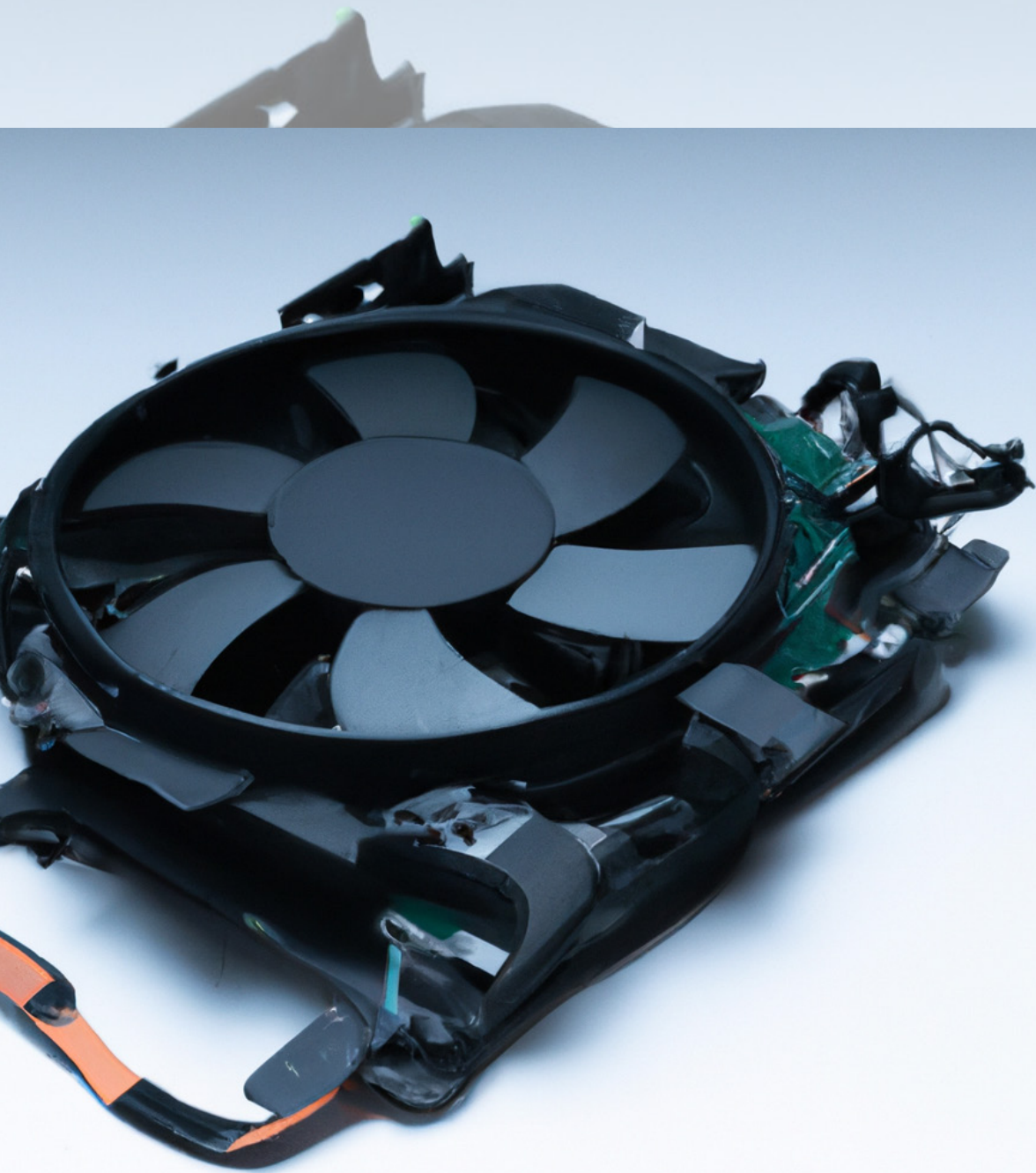
Pull the fan cable straight up and off its socket on the motherboard.



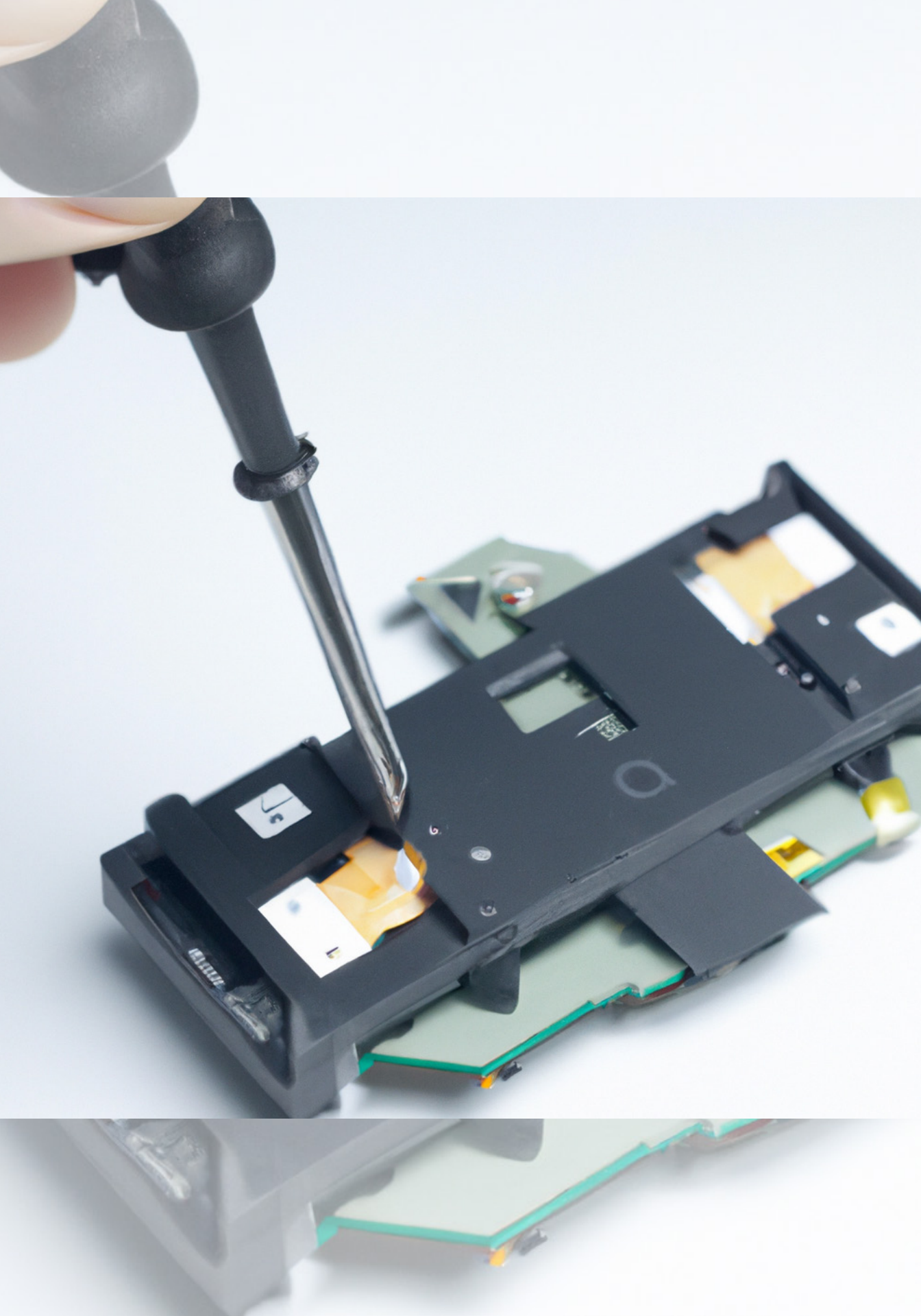
Remove the fan and power switch assembly by pulling it out of the bottom case.



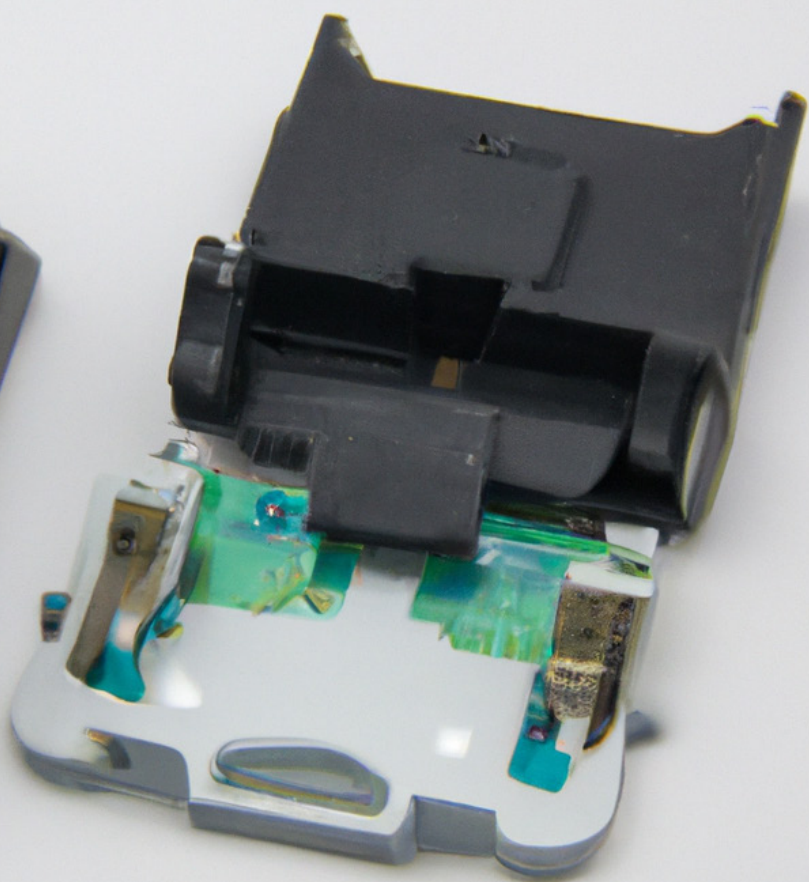
Remove the fan from the power switch assembly.



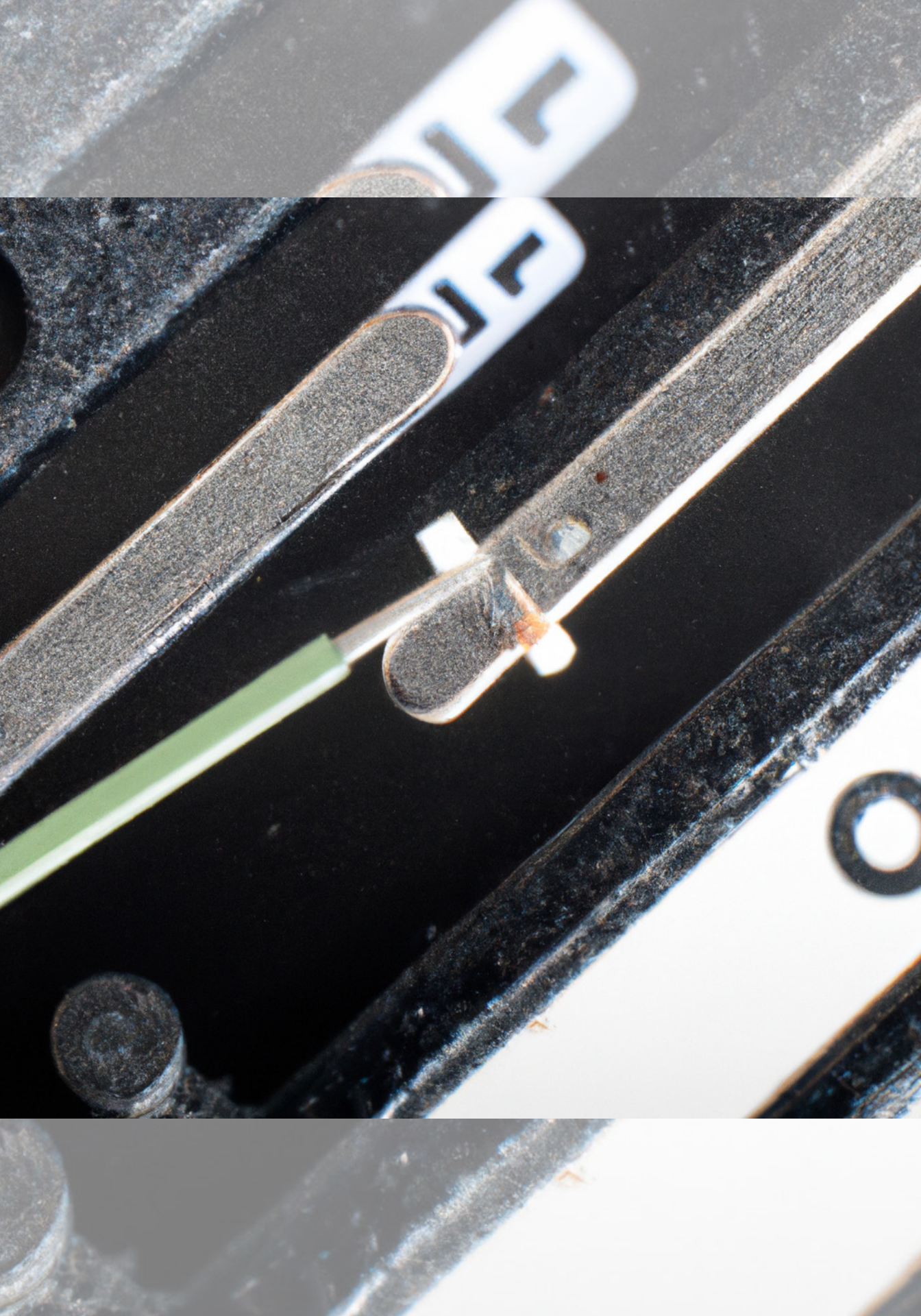
The fan simply slides out of the top along its track.



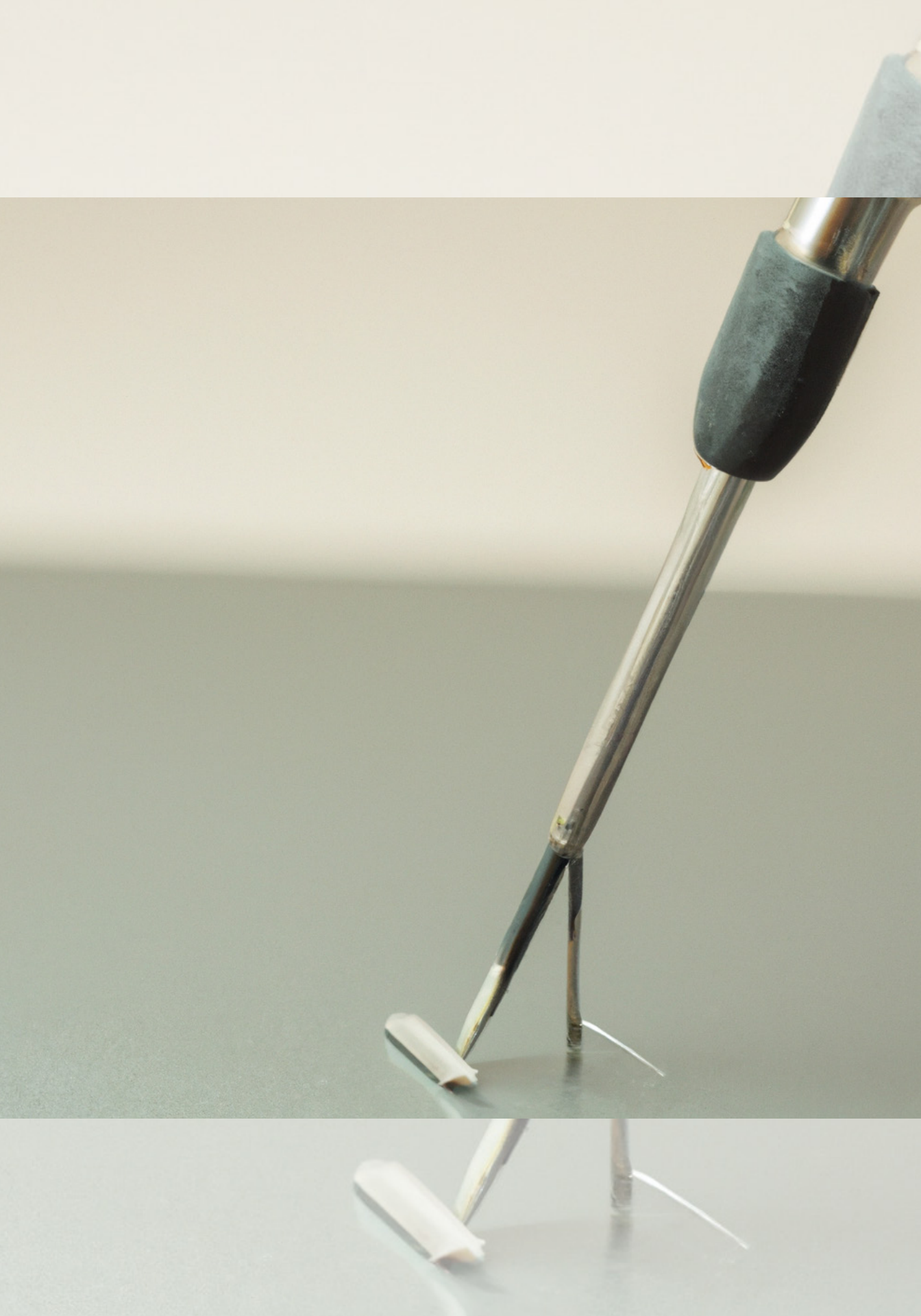
Remove the power switch from its recess within the fan/power switch holder.



The power switch simply slides out just like the fan.



Be mindful of the pins as you lift up and remove the function/set button.



Take one pin out.

This guide was generated by GPT-2 trained on the complete tutorial data of iFixit with minor edits to increase legibility.

The images were picked from an output of Dall-E 2 for every corresponding sentence.

Both neural networks are courtesy of OpenAI.

The text of this guide first appeared in 1000 Scores. Pieces for Here, Now & Later.

Thanks to Jan and Hannes for giving me access to the tools.

**0x0a
2022**

For Tavi

**Work tactics
break technology**



0x0a