



Mainboard Replacement for Framework Laptop 12

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INTRODUCTION

Follow this guide to replace or upgrade the Mainboard in your Framework Laptop 12.

The Mainboard (aka motherboard) is responsible for the primary functions for your laptop. If you want to upgrade your processor, you'll need to replace the Mainboard.

Replacement Mainboard kits come with the fan and heatsink pre-attached, so you don't need to worry about applying thermal compound to the processor.

You'll encounter some component terms in this guide:

- The **Input Cover** is the part that contains the Keyboard and Trackpad.



TOOLS:

- [Framework Screwdriver](#) (1)
-

Step 1 — Software preparations



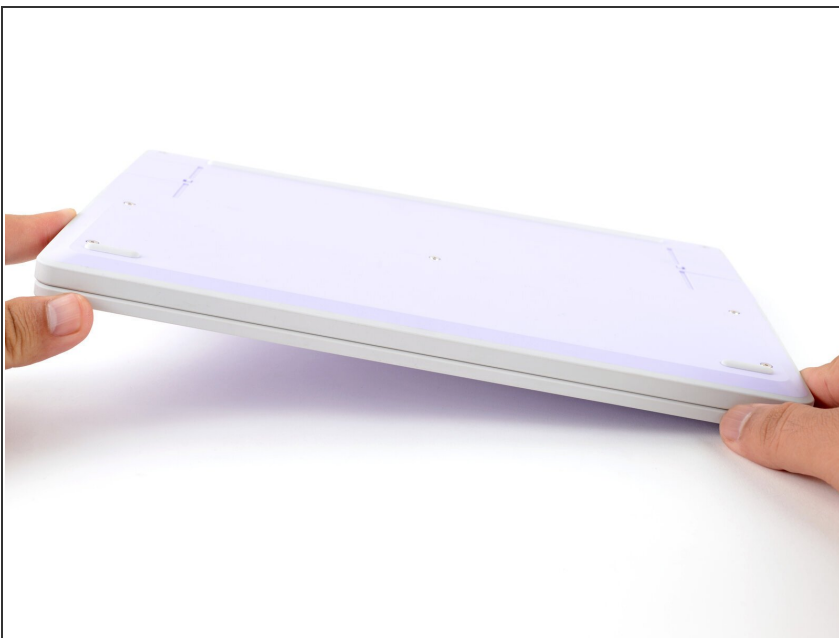
- ❗ If you're running Windows, perform these steps before you begin repairs:
- Make sure you [back up your data](#).
 - If you're running a Pro version of Windows, suspend BitLocker by following [these directions](#).
 - If you're running a Home version of Windows and have enabled Windows Device Encryption, you will want to disable it. To disable it, press Win + I to open Settings and select Privacy & Security. Select Device Encryption, then toggle the Device Encryption setting to Off.
 - Find your product key or link your Windows license to a Microsoft account to make sure you can [re-activate Windows](#) after the change.

Step 2 — Power down your Laptop



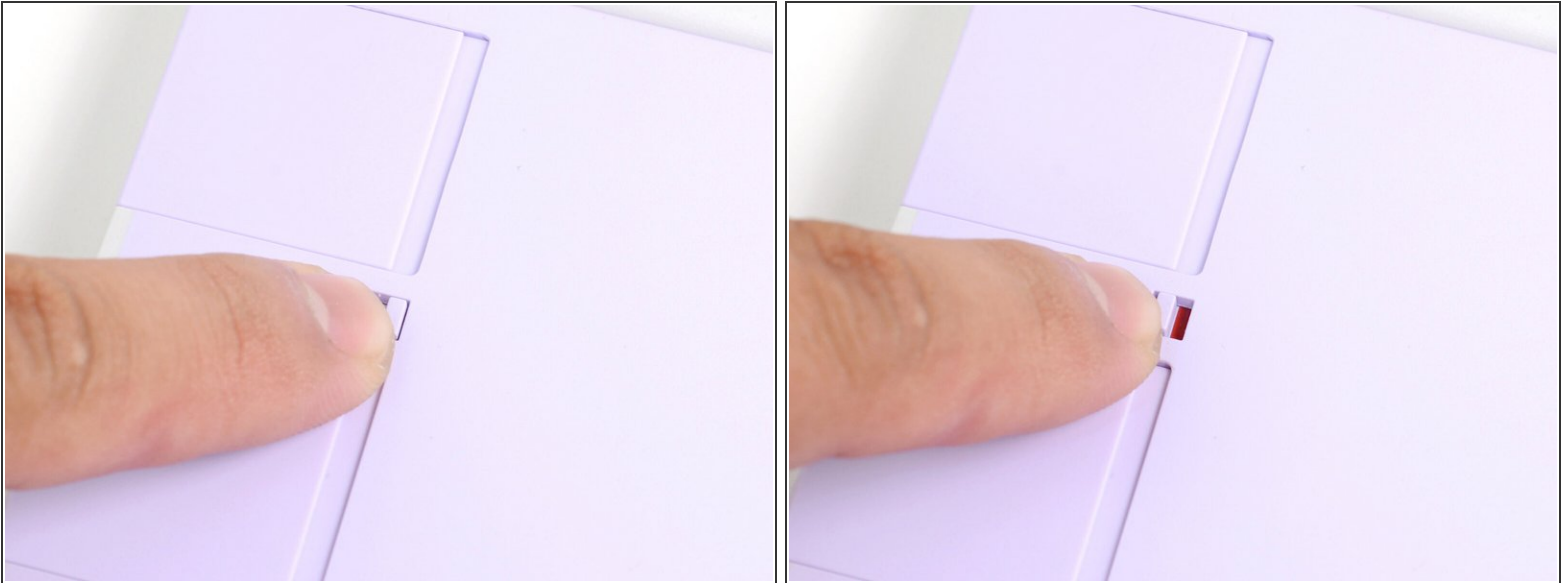
- Before you begin repairs, unplug your Laptop and **shut it down from the operating system**. This ensures that the Laptop isn't in standby/suspend mode.
 - ⓘ The indicator LEDs along the edges should be unlit. The Laptop should be silent.
 - ⓘ If you accidentally turn on the Laptop during repair, hold the power button down for 10 seconds to shut it down.
- Make sure your Framework Screwdriver has the T5 Torx bit (labeled as T-5) facing outwards. If it's not, pull the bit out and flip it.

Step 3 — Set your laptop down



- Set your Framework Laptop face-down on a clean work surface.

Step 4 — Remove the Expansion Cards



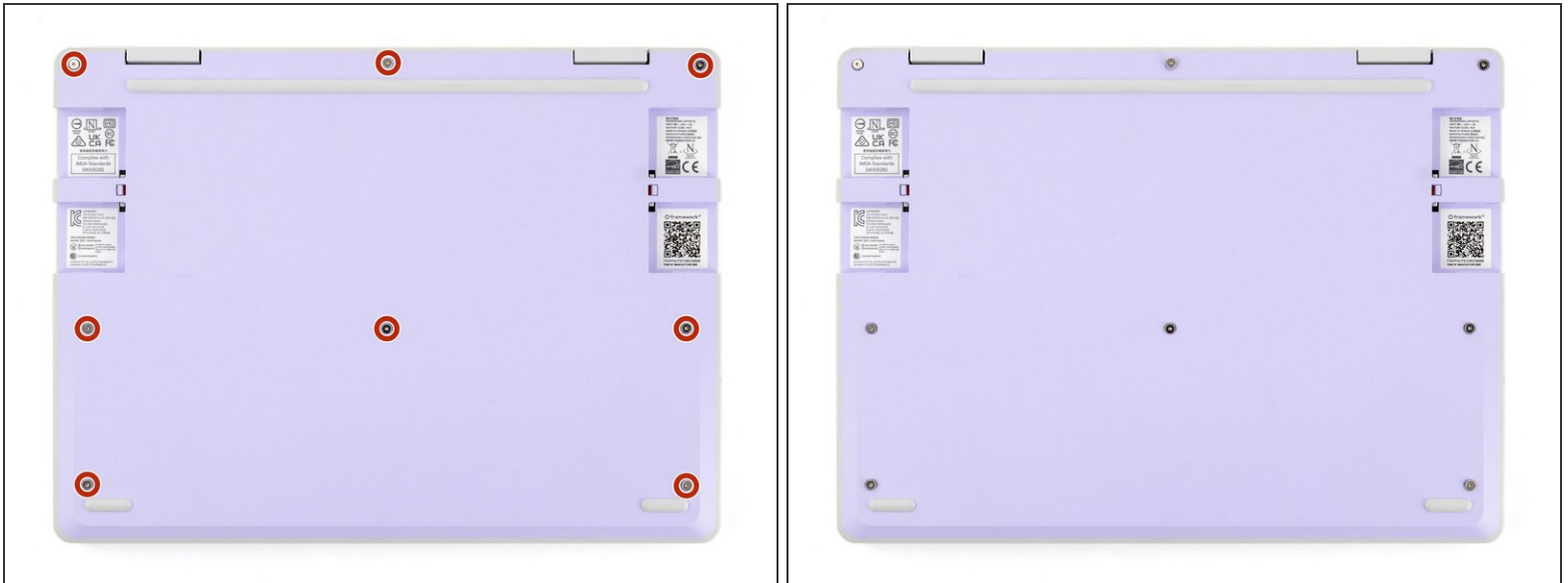
- Use your fingers to flip the two Expansion Card latches (one for each side) into the **unlocked** position.
 - ① The latches display a red bar when they're unlocked.

Step 5



- Grip the lip of an Expansion Card with your fingers.
- Pull the Expansion Card out of its slot and remove it.
 - ① If you have trouble pulling the Expansion Card out, you can also use the flat end of your Framework Screwdriver to push against the lip.
- Repeat this procedure to remove **all remaining Expansion Cards**.

Step 6 — Loosen the bottom screws



- Use your Framework Screwdriver to fully loosen the eight captive T5 Torx screws on the bottom of your laptop.
 - ① Most screws in your Framework Laptop (including these) are captive—they're designed to stay in place after you loosen them.
 - ① Your laptop comes with a spare set of screws [in the frame above the battery](#). Be careful—the replacement screws aren't captive.

Step 7 — Flip your laptop over



- Flip your laptop face-up on your work surface.

Step 8 — Open your laptop



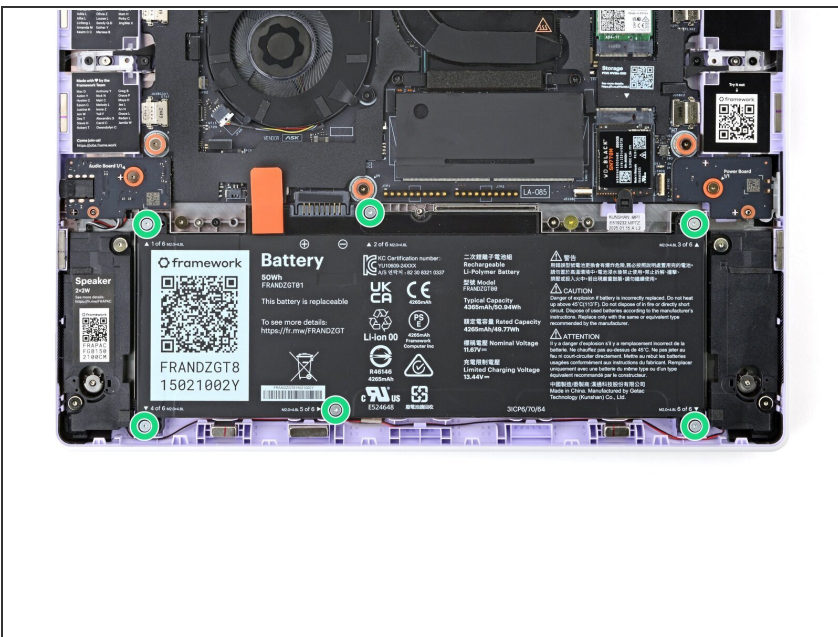
- Open the laptop lid so that both the screen and the base lie flat on your work surface.

Step 9 — Remove the Input Cover



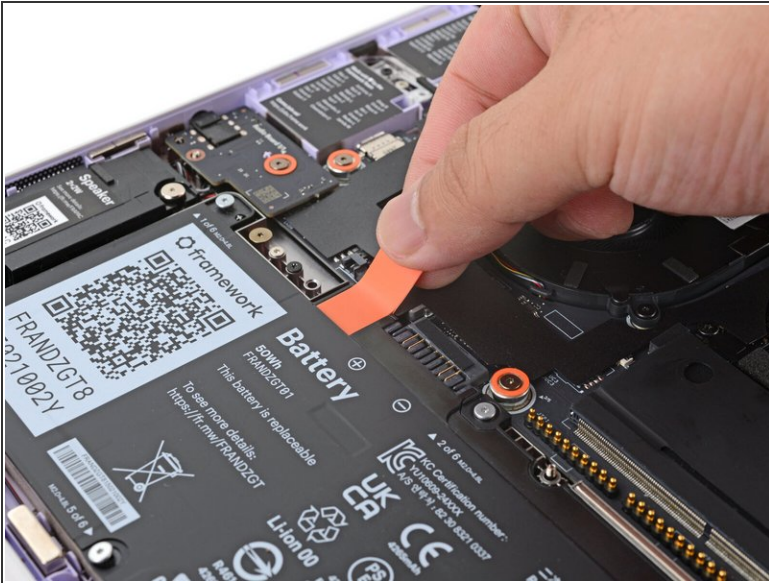
- Use your fingers to grip the Input Cover in the hinge cutouts.
- Lift upwards to swing the Input Cover up from the base of the laptop.
 - ❗ You may feel resistance from the magnets. If the cover feels like it's snagged, check that you've fully loosened the screws on the bottom of your laptop.
- Remove the Input Cover.

Step 10 — Loosen the battery screws



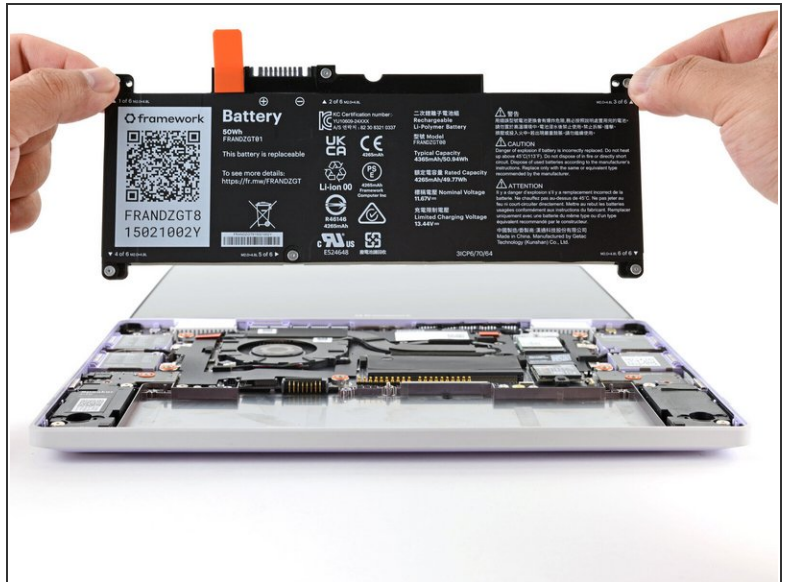
- Use your Framework Screwdriver to loosen the six captive T5 Torx screws securing the battery.

Step 11 — Disconnect the battery



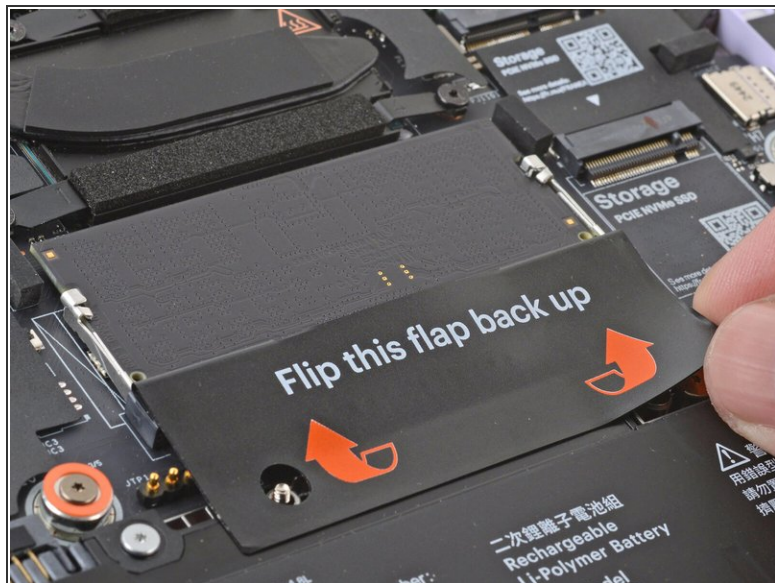
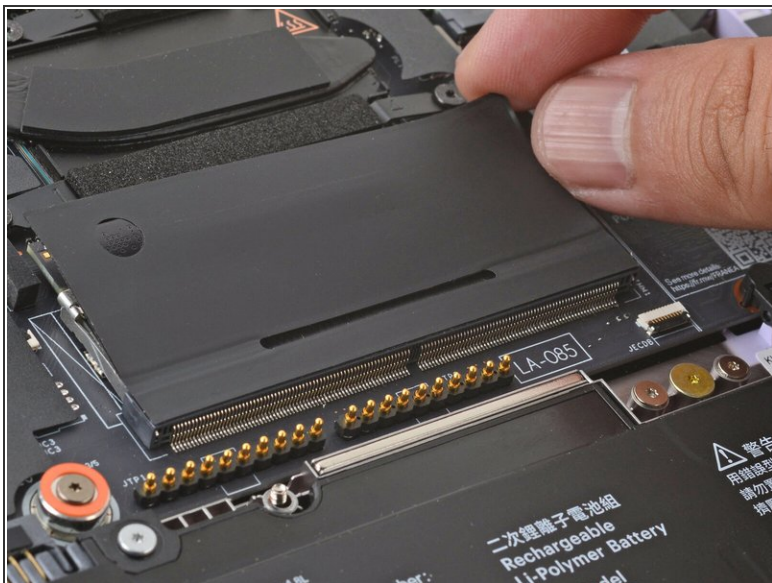
- Grab the orange battery tab with your fingers and lift straight up to disconnect the battery.
 - ① The battery connector can be tight, requiring some force. If it feels like part of the battery won't come up, check that the battery screws are fully loosened.

Step 12 — Remove the Battery



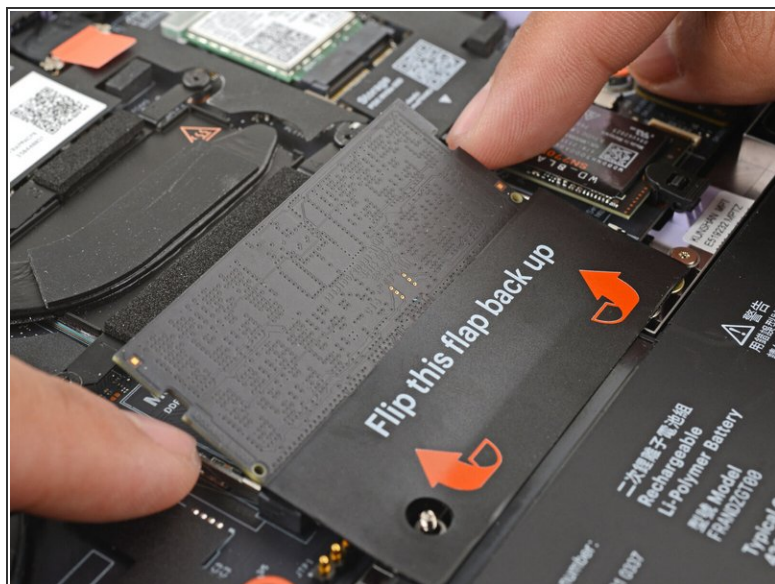
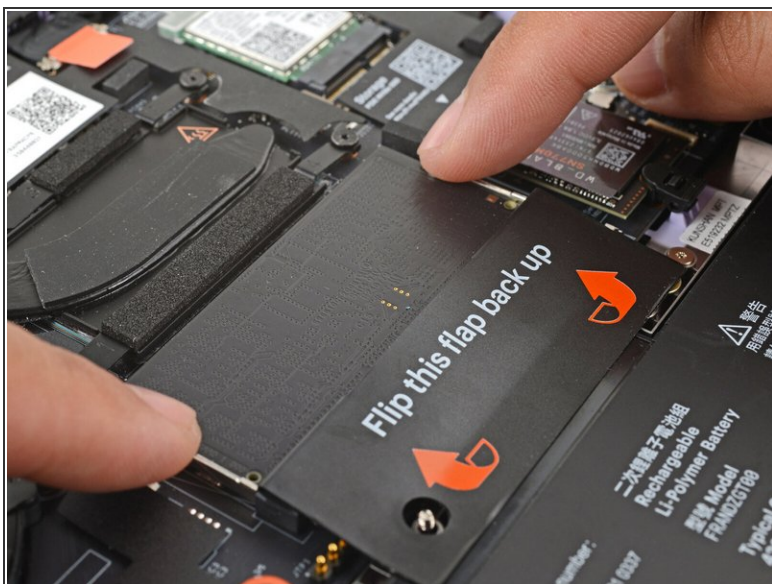
- Lift and remove the battery from the laptop.

Step 13 — Open the memory flap



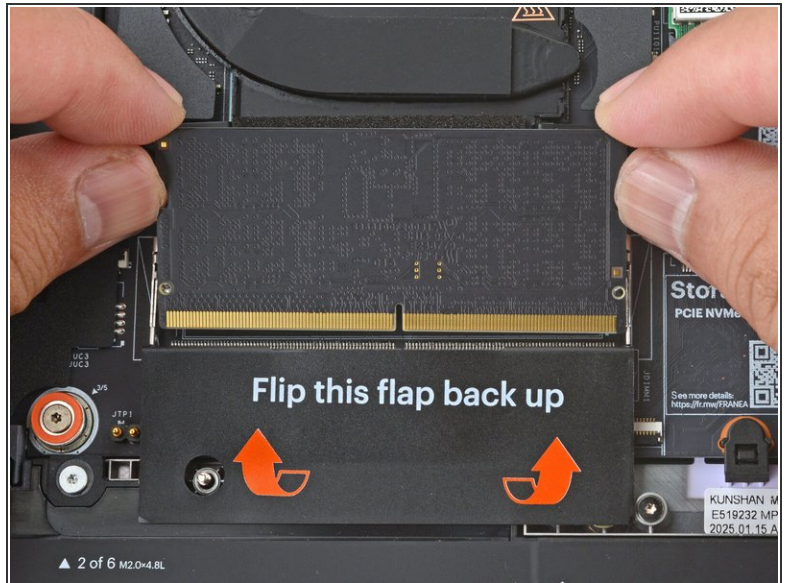
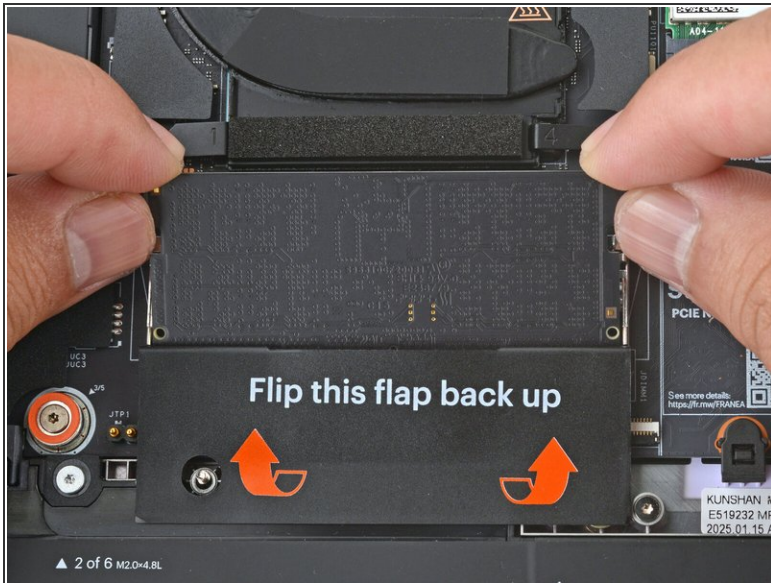
- Use your fingers to flip open the memory flap.

Step 14 — Remove the memory module



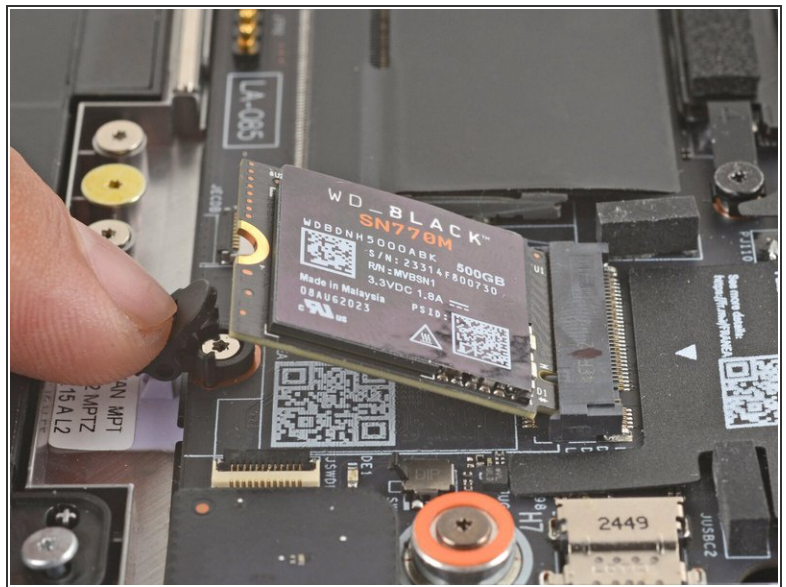
- Use your fingers to spread the clips on both sides of the memory module apart to unclip the memory.
 - ① The memory module will pop up to an angle when it's unclipped.

Step 15



- Use your fingers to grab the memory module by its edges.
- Slide the memory module out of its socket and remove it.

Step 16 — Unlatch the SSD



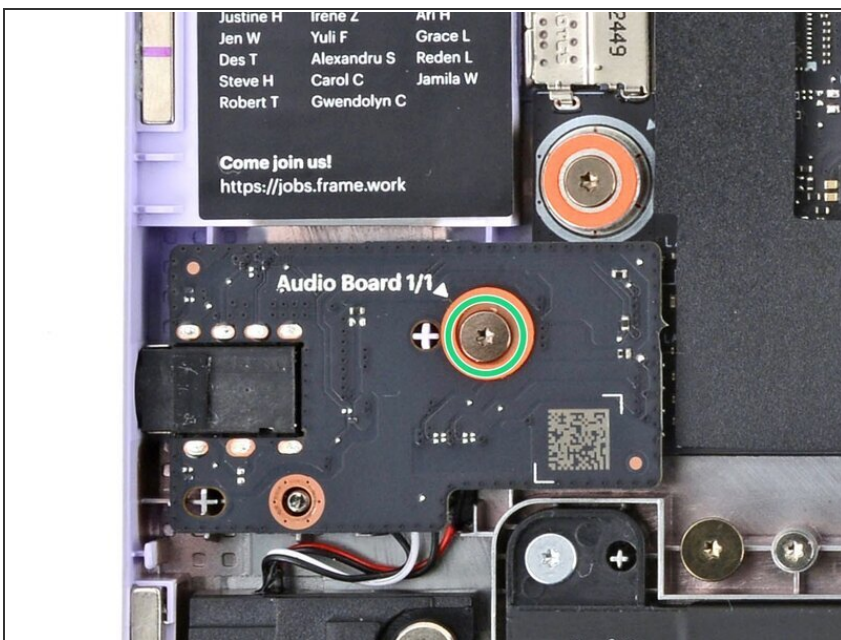
- Use your finger to press down on the black SSD latch to unlatch the SSD.
 - ① The SSD will pop up to an angle when it's unlatched.

Step 17 — Remove the SSD



- Grab the SSD by its edges and pull it out of its socket.
- Remove the SSD.

Step 18 — Loosen the Audio Board screw



- Use your Framework Screwdriver to loosen the captive T5 Torx screw securing the Audio Board along the left edge of the laptop.

Step 19 — Remove the Audio Board



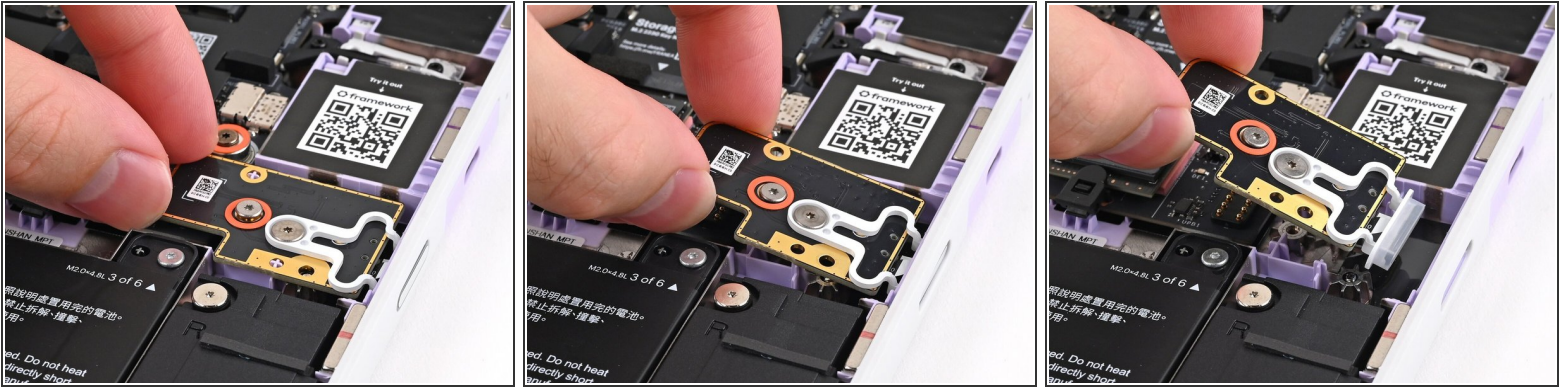
- Use your fingers to lift the right edge of the Audio Board and pull it out of its recess.
- Remove the Audio Board.

Step 20 — Loosen the Fingerprint Reader screw



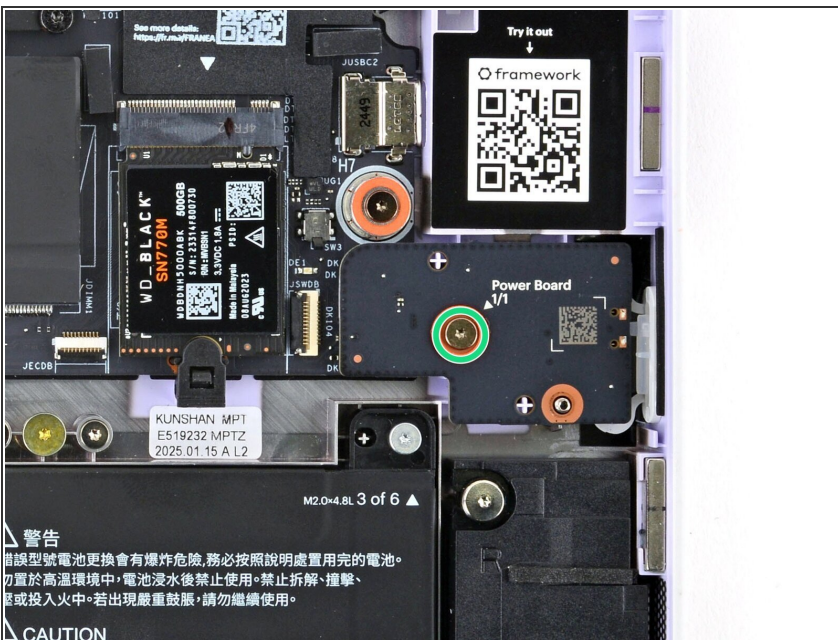
- ❗ If your laptop doesn't have a Fingerprint Reader, skip the next two steps.
- Use your Framework Screwdriver to loosen the captive T5 Torx screw securing the Fingerprint Reader.

Step 21 — Remove the Fingerprint Reader



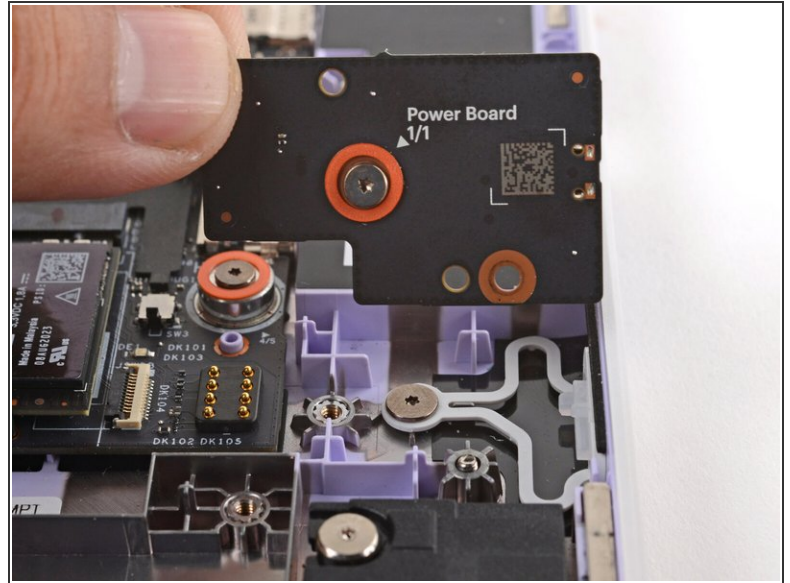
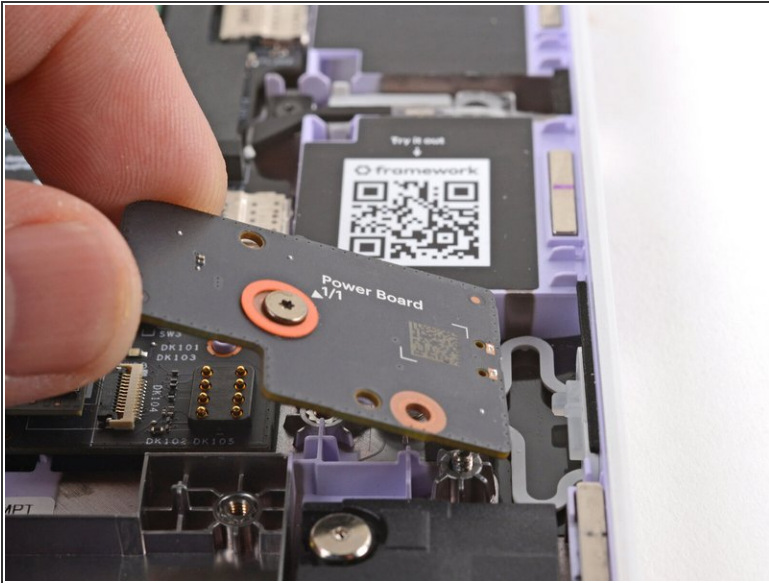
- Use your fingers to lift and remove the Fingerprint Reader.
- Skip the next two steps.

Step 22 — Loosen the Power Button Board screw



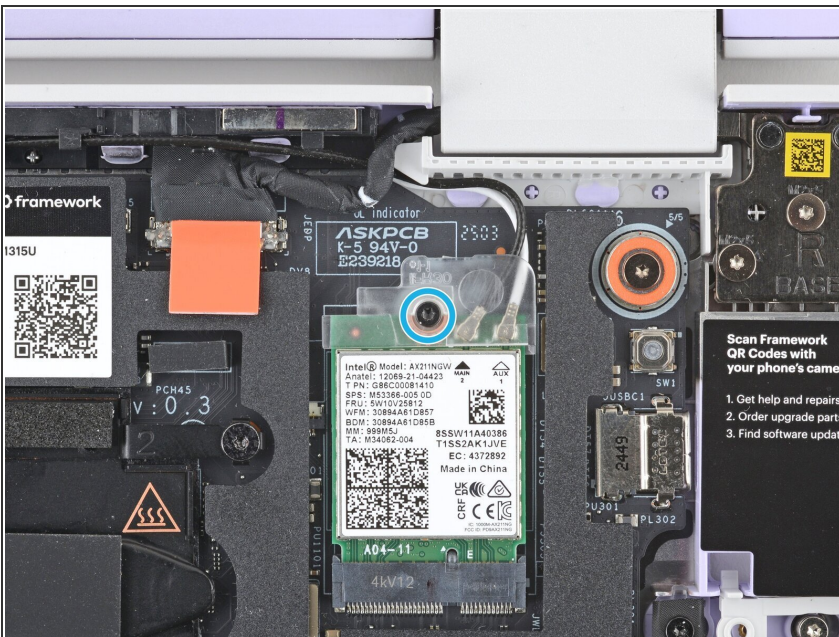
- Use your Framework Screwdriver to loosen the captive T5 Torx screw securing the Power Button Board (labeled "Power Board").

Step 23 — Remove the Power Button Board



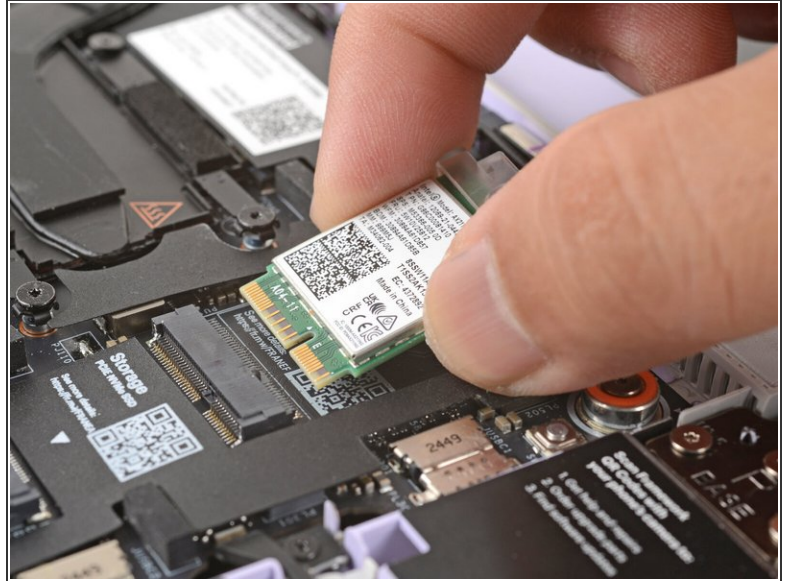
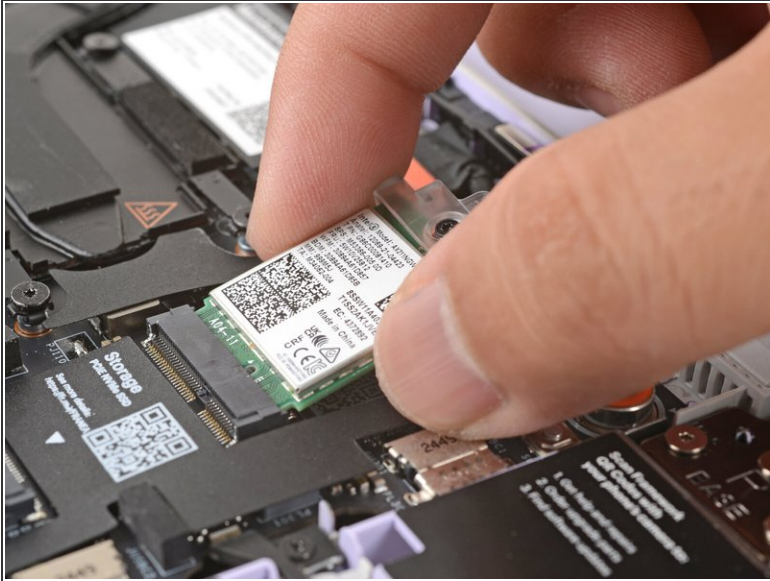
- Use your fingers to lift and remove the Power Button Board.

Step 24 — Loosen the Wi-Fi card screw



- Use your Framework Screwdriver to loosen the captive T5 Torx screw securing the Wi-Fi card bracket.
- ⓘ The Wi-Fi card will pop up slightly when you unfasten the bracket.

Step 25 — Reposition the Wi-Fi card



⚠ Be careful not to strain the two delicate antenna cables attached to the Wi-Fi card.

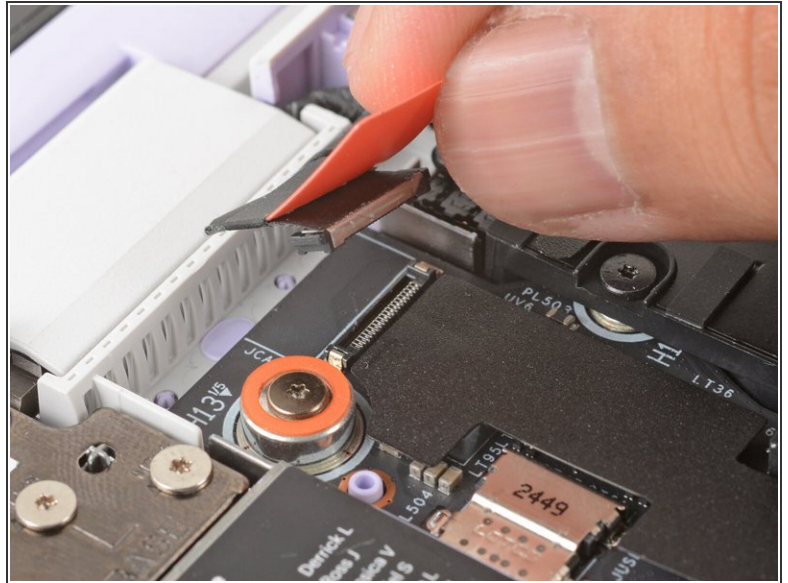
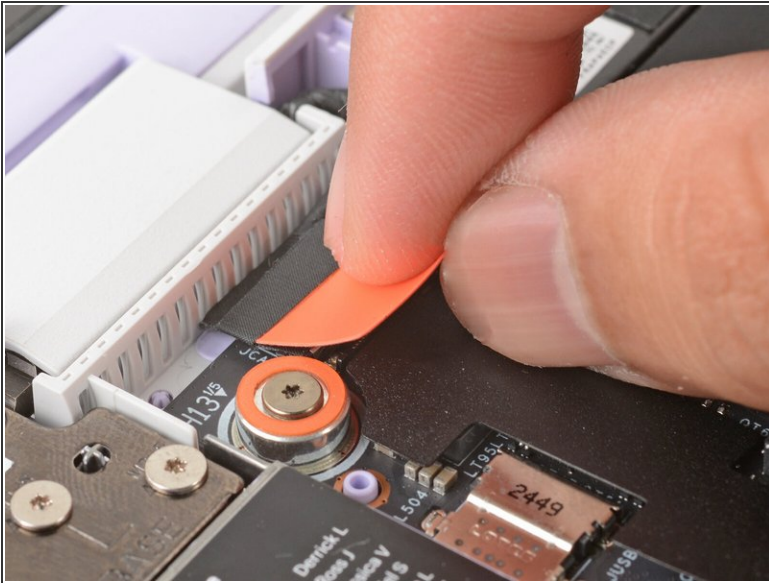
- Grab the Wi-Fi card by its edges and slide it out of its socket.

Step 26



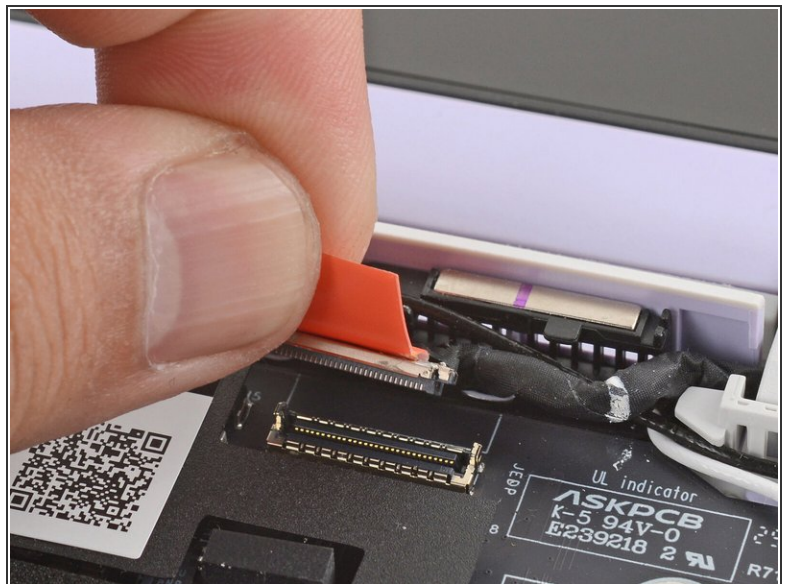
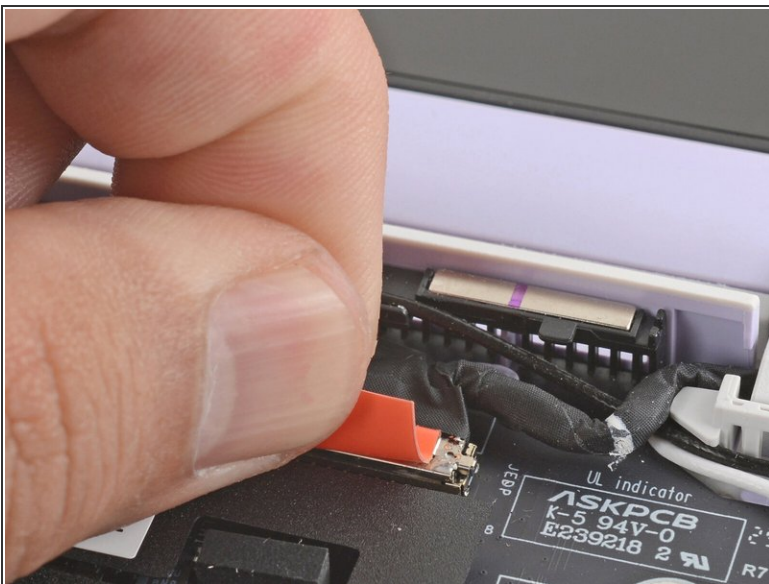
- Carefully reposition the Wi-Fi card away from the Mainboard.
- ① If the clear bracket or an antenna cable detaches from the Wi-Fi card, don't worry! You can reattach it during reassembly.

Step 27 — Disconnect the webcam cable



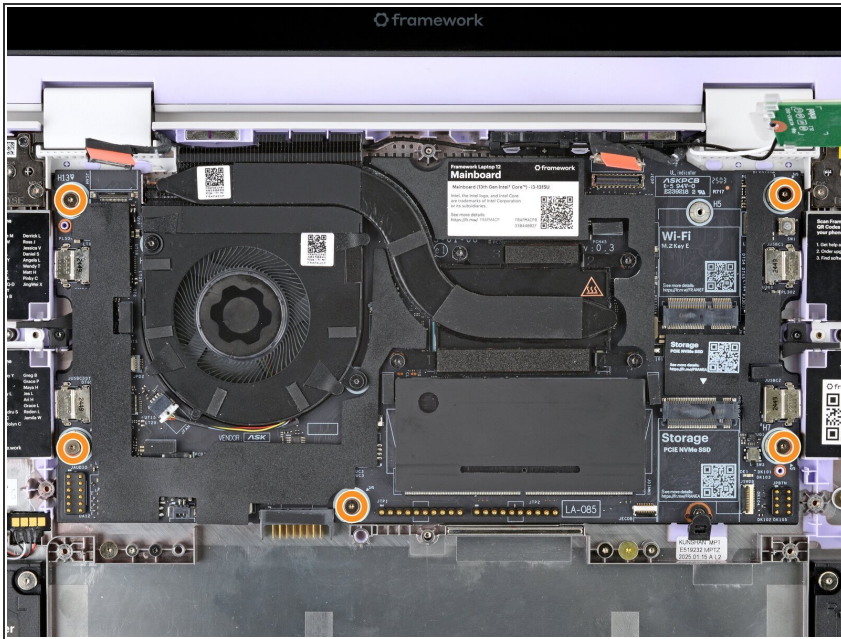
- Use your fingers to grab the orange tab on the webcam cable, located near the left hinge.
- Lift straight up to disconnect the cable.

Step 28 — Disconnect the display cable



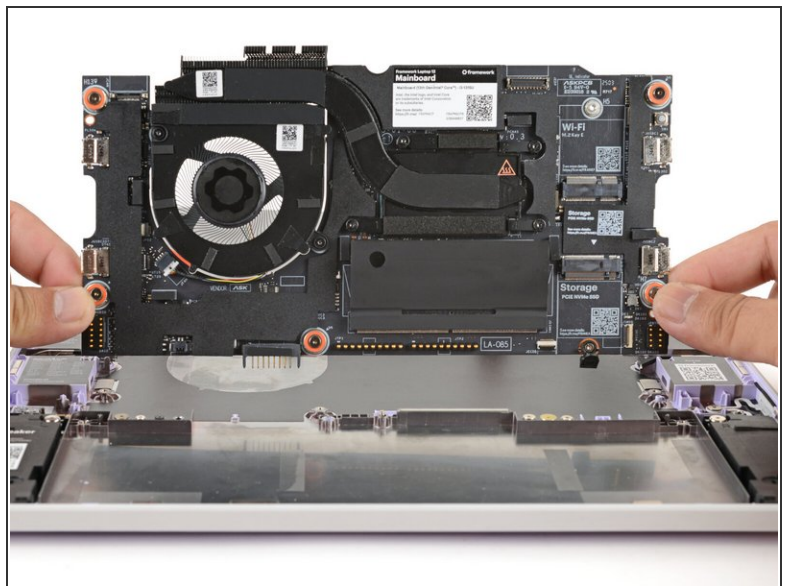
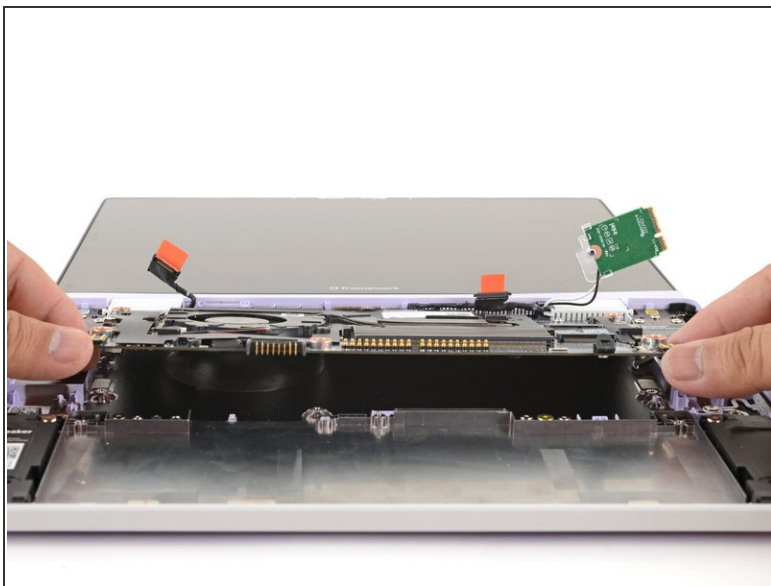
- Use your fingers to grab the orange tab on the display cable, located near the right hinge.
- Lift straight up to disconnect the cable.

Step 29 — Loosen the Mainboard screws



- Use your Framework Screwdriver to loosen the five captive T5 Torx screws securing the Mainboard.
- ⓘ These screws are also physically marked with an orange ring on the Mainboard.

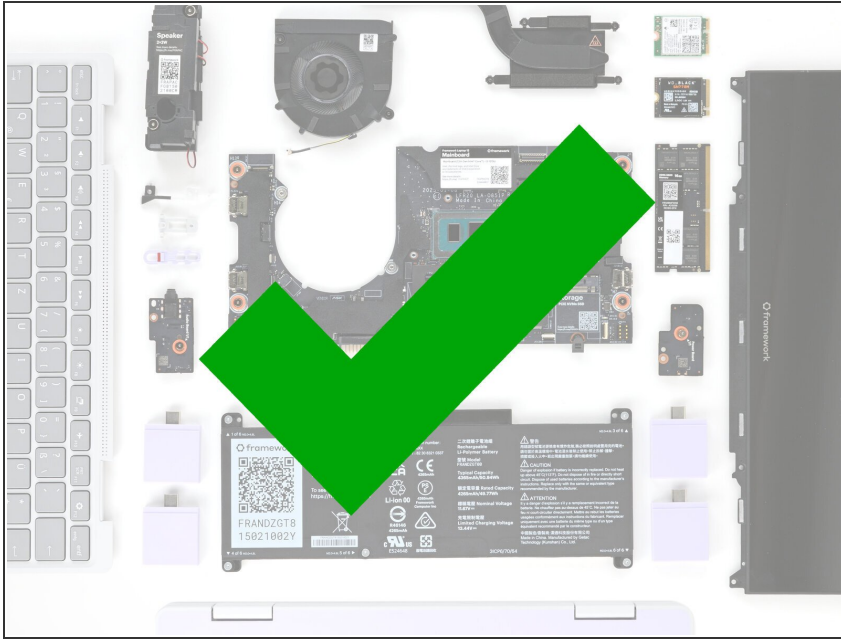
Step 30 — Remove the Mainboard



⚠ Make sure you've [removed all Expansion Cards](#). Installed cards will hold the Mainboard in place.

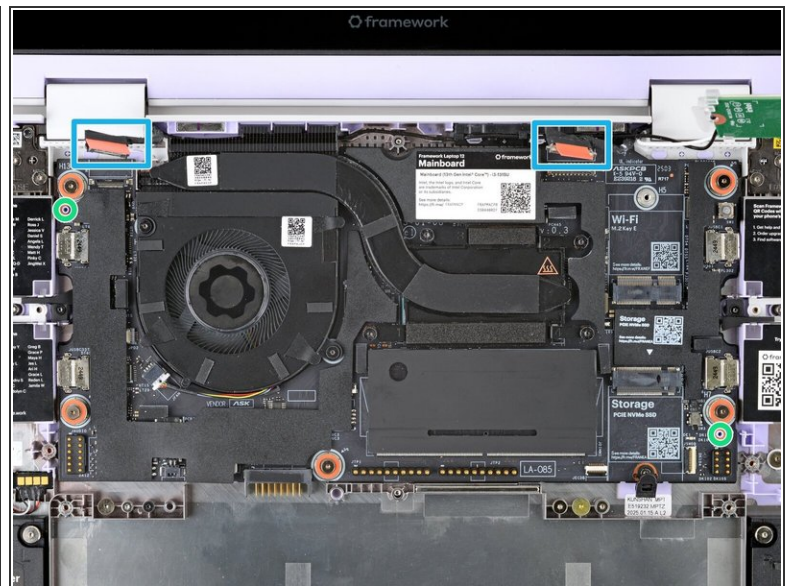
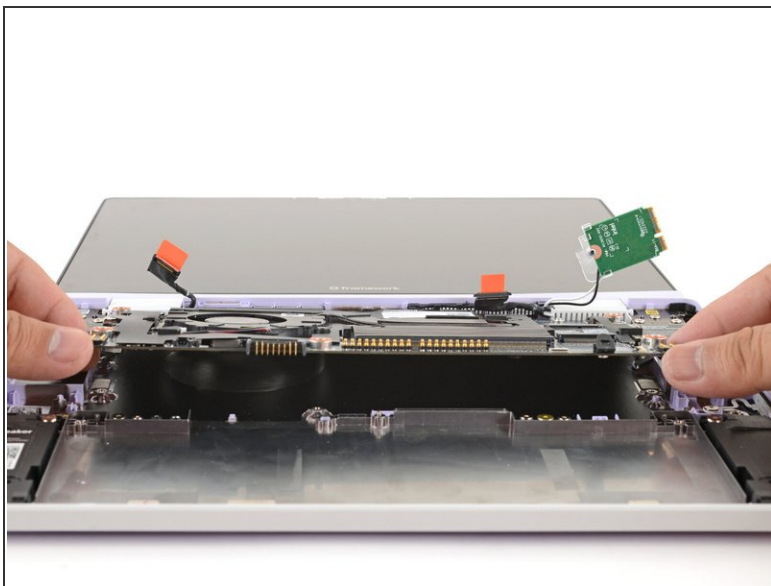
- Use your fingers to grab the Mainboard by its edges.
- Lift and remove the Mainboard.

Step 31 — Disassembly complete



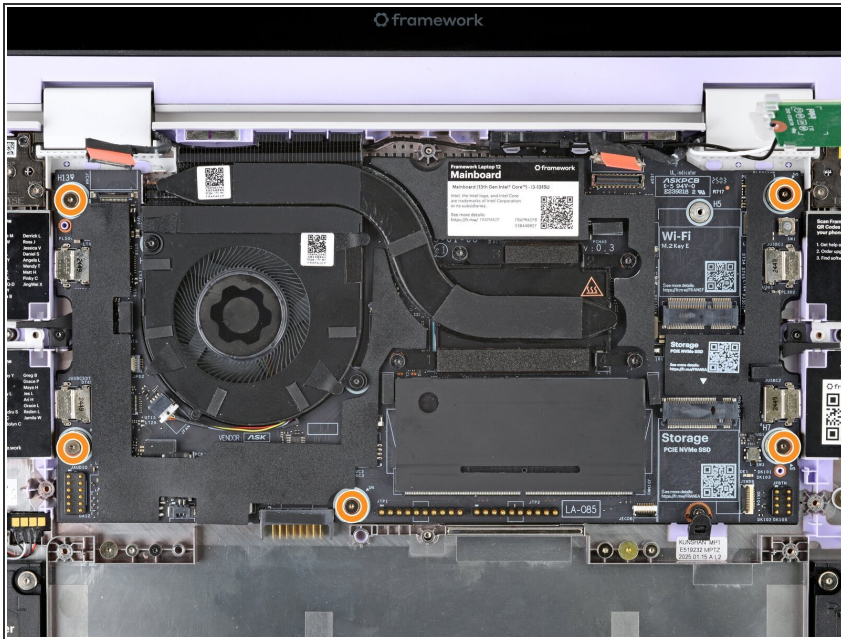
📘 Congratulations on completing disassembly! **The remaining steps will show how to reassemble your Framework Laptop.**

Step 32 — Install the Mainboard



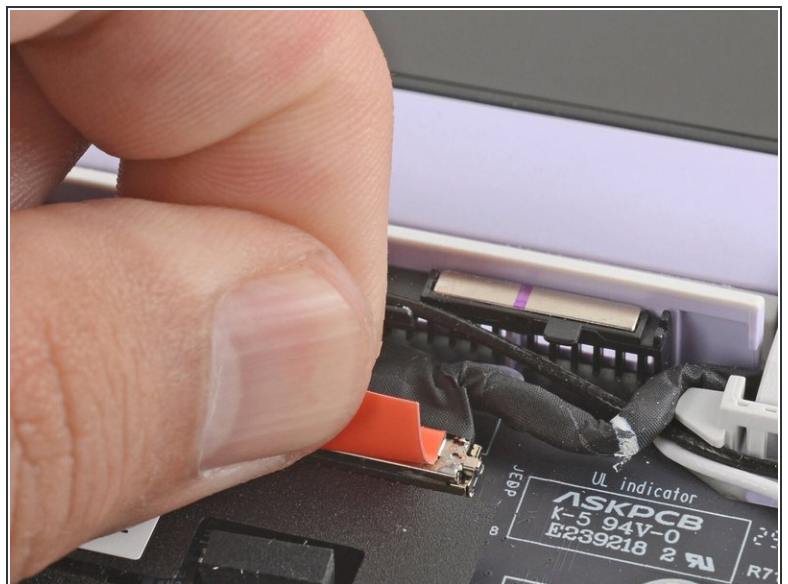
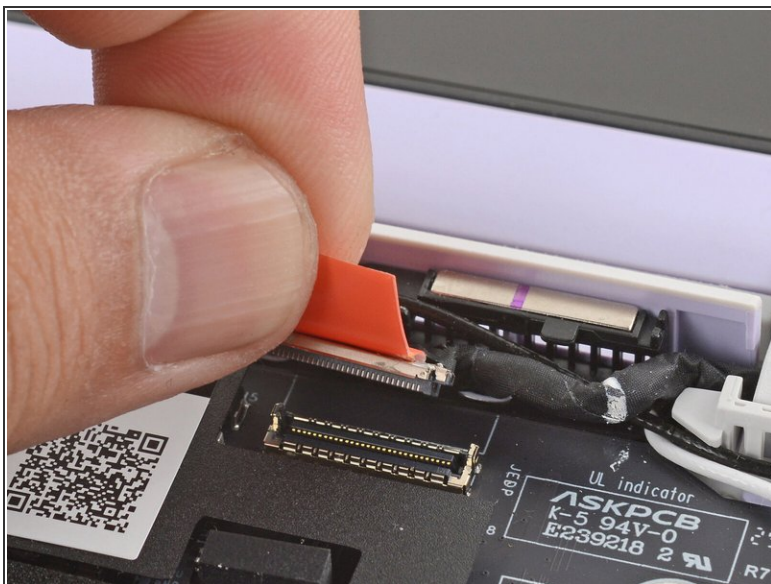
- Carefully lay the Mainboard in the laptop.
- Use the two alignment pins to help align the Mainboard to the laptop.
- Be careful not to trap the webcam or display cables under the Mainboard as you set it in place.

Step 33 — Screw in Mainboard screws



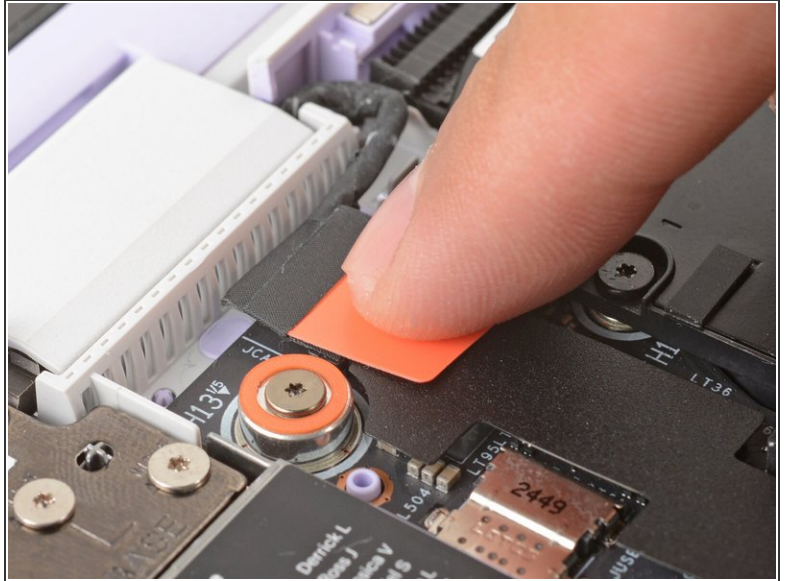
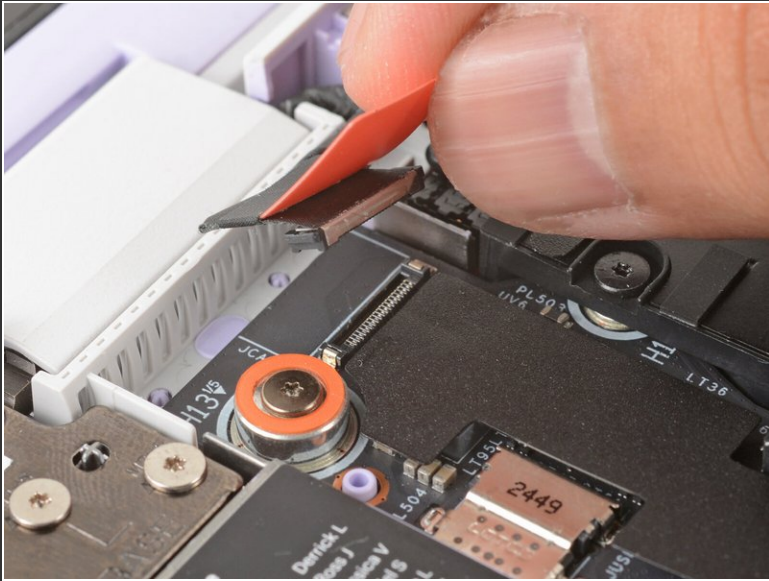
- Use your Framework Screwdriver to tighten the five captive T5 Torx screws to secure the Mainboard.
- ⓘ Tighten the screws until they're snug. Don't over-tighten them, or you may strip the screws.

Step 34 — Connect Display cable to Mainboard



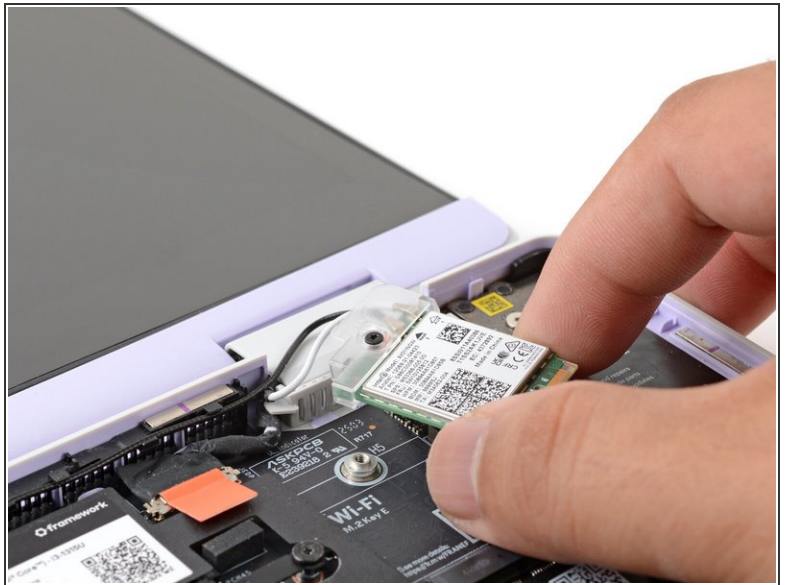
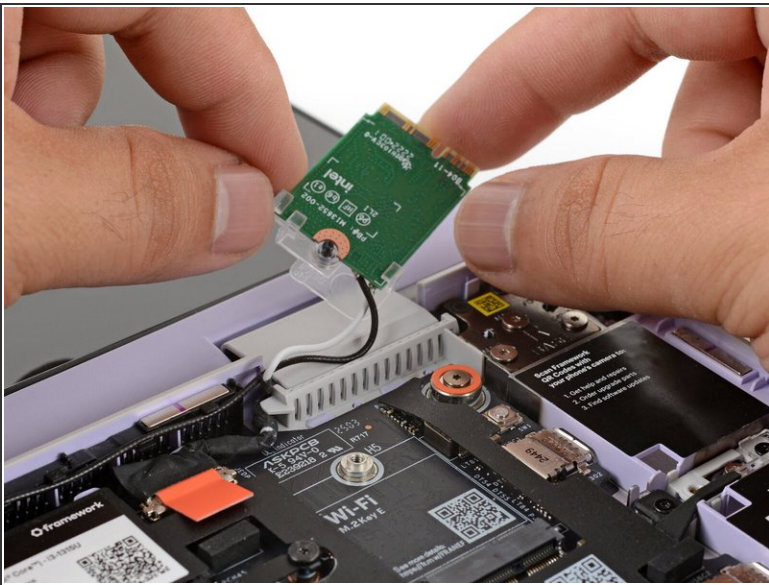
- Use your fingers to grab the display cable by its orange tab.
- Align and press the display cable straight down onto its connector.

Step 35 — Connect Webcam cable to Mainboard



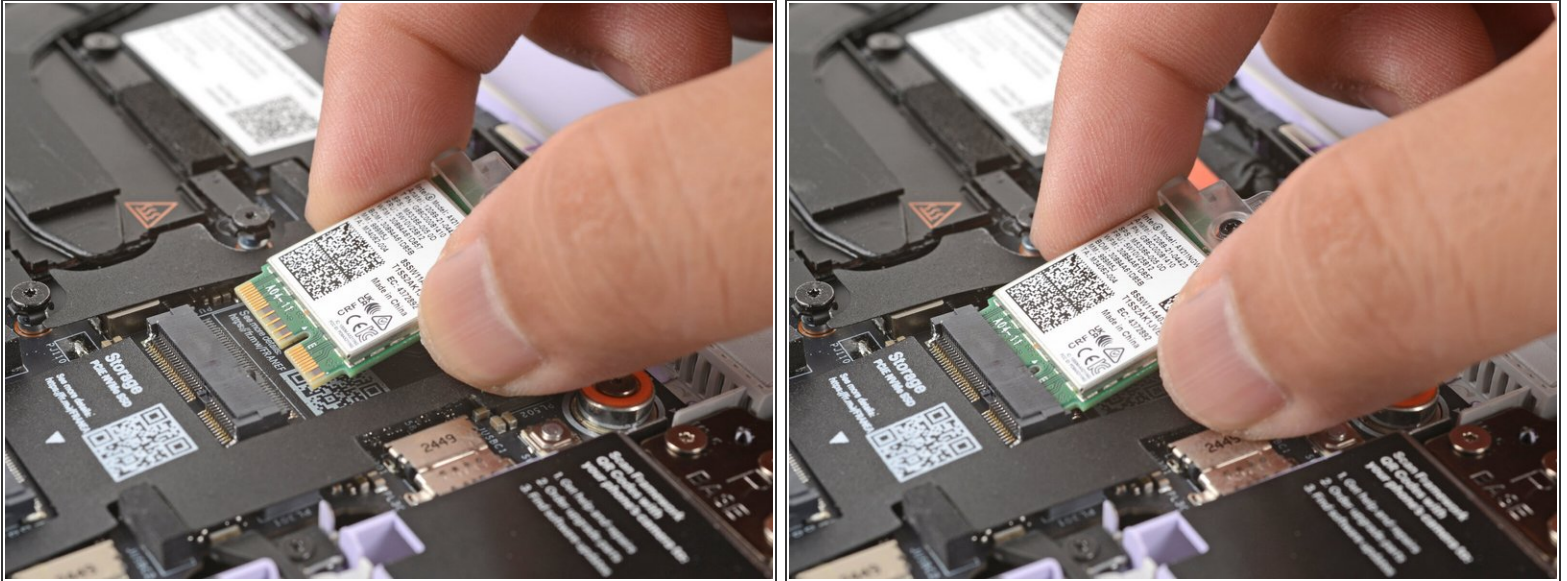
- Use your fingers to grab the webcam cable by its orange tab.
- Align and press the webcam cable straight down onto its connector.

Step 36 — Install the Wi-Fi card



- Use your fingers to carefully move the Wi-Fi card over the Mainboard.

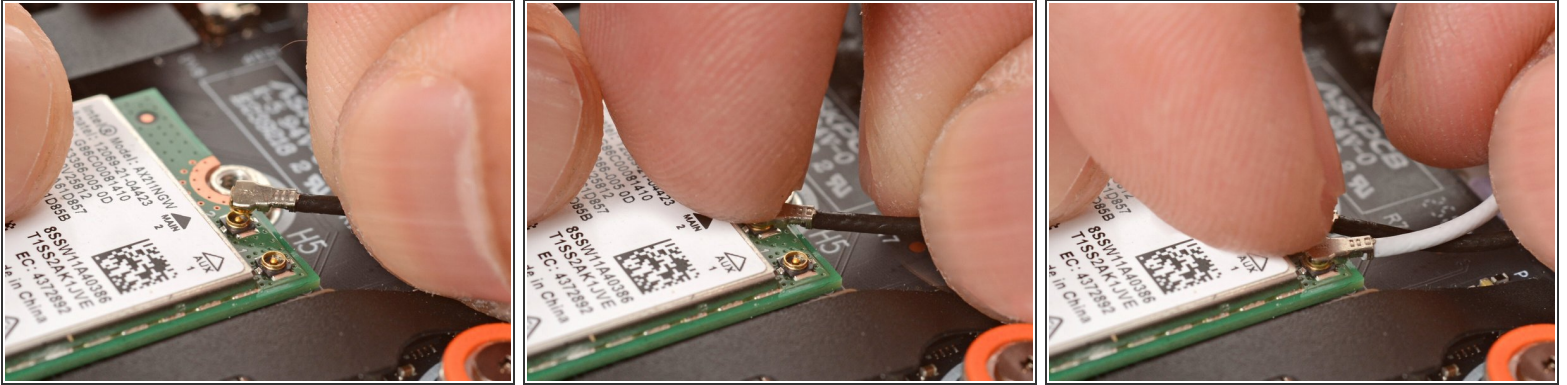
Step 37



⚠ Hold the Wi-Fi card by its edges. Don't touch the gold contacts with your fingers. If you do, wipe the contacts with a clean, lint-free cloth to remove any finger oils.

- Align the Wi-Fi card's gold contacts and notch with the socket on the Mainboard.
- Insert the Wi-Fi card into the socket at a shallow angle. The gold contacts should mostly be covered by the socket.
- ⓘ If the clear Wi-Fi card bracket or antenna cables got disconnected during the repair, **go to the next step**. If they're still attached, skip down three steps.

Step 38 — Reconnect a disconnected antenna cable



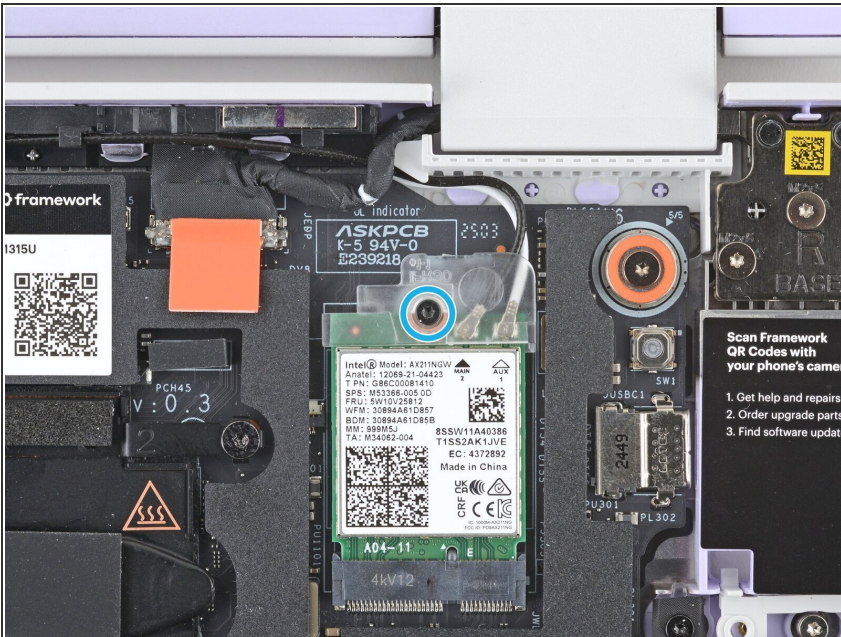
- ① Follow the next two steps if an antenna cable disconnected from the Wi-Fi card.
- Hold the Wi-Fi card down with your finger.
- Position the black antenna cable connector over the left Wi-Fi card's coaxial socket.
 - ① Tweezers can help position the connector.
- Use your finger to press the connector into place. You should feel a faint click, and the cable will stay attached to the socket by itself.
- ⚠ These connectors are very delicate! If the connector doesn't feel like it's clicking in place, reposition the connector and try again.
- Repeat the procedure with the white antenna cable.

Step 39



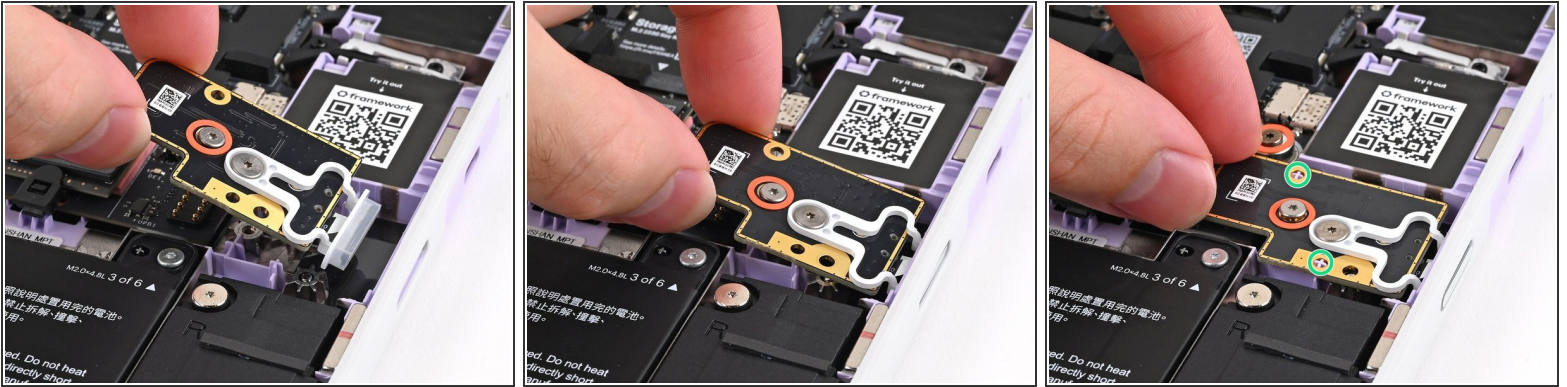
- Slide the Wi-Fi bracket over the top edge of the Wi-Fi card.

Step 40 — Tighten the Wi-Fi card screw



- Use your Framework Screwdriver to tighten the captive T5 Torx screw to secure the Wi-Fi card.

Step 41 — Install the Fingerprint Reader



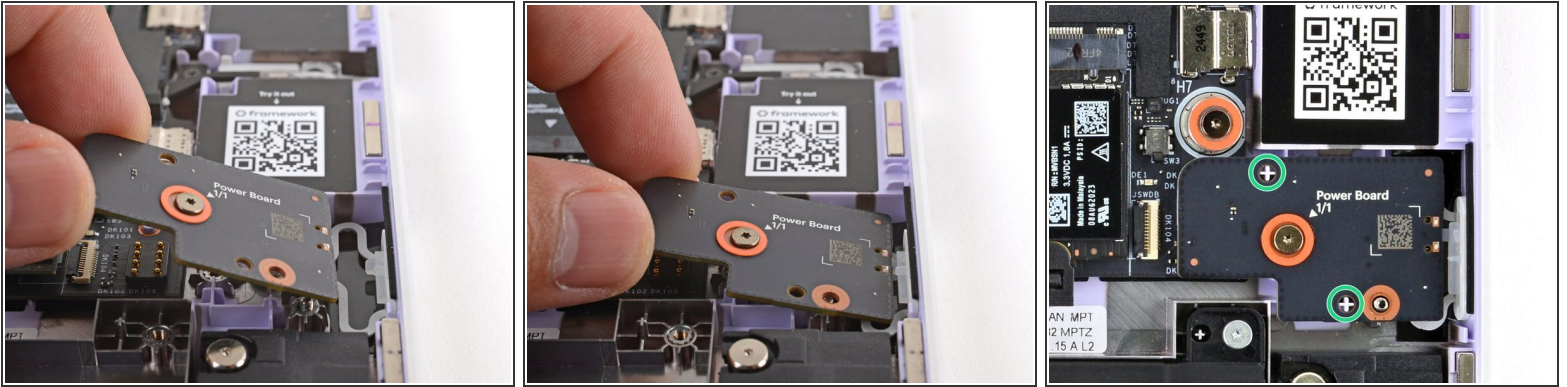
- ① If your laptop doesn't have a Fingerprint Reader, skip the next two steps.
- Use your fingers to lay the Fingerprint Reader in place.
- Use the [two plastic pins](#) on the laptop to align the Fingerprint Reader.

Step 42 — Tighten Fingerprint Reader screw



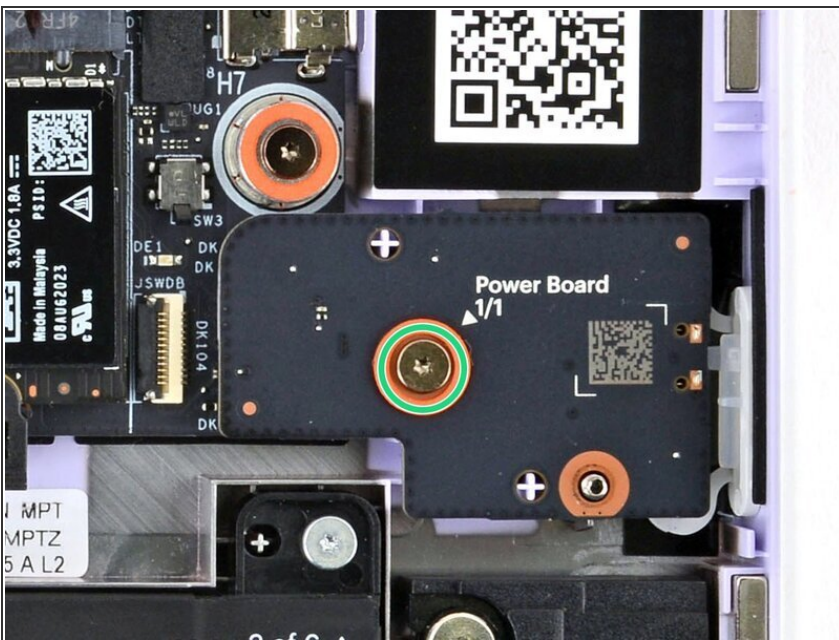
- Use your Framework Screwdriver to tighten the captive T5 Torx screw to secure the Fingerprint Reader.
- ① Tighten the screw until it's snug. Don't over-tighten it, or you may strip the screw.
- Skip the next two steps.

Step 43 — Install the Power Button Board



- Use your fingers to lay the Power Button Board in place.
- Use the two plastic pins on the laptop to align the Power Button Board.

Step 44



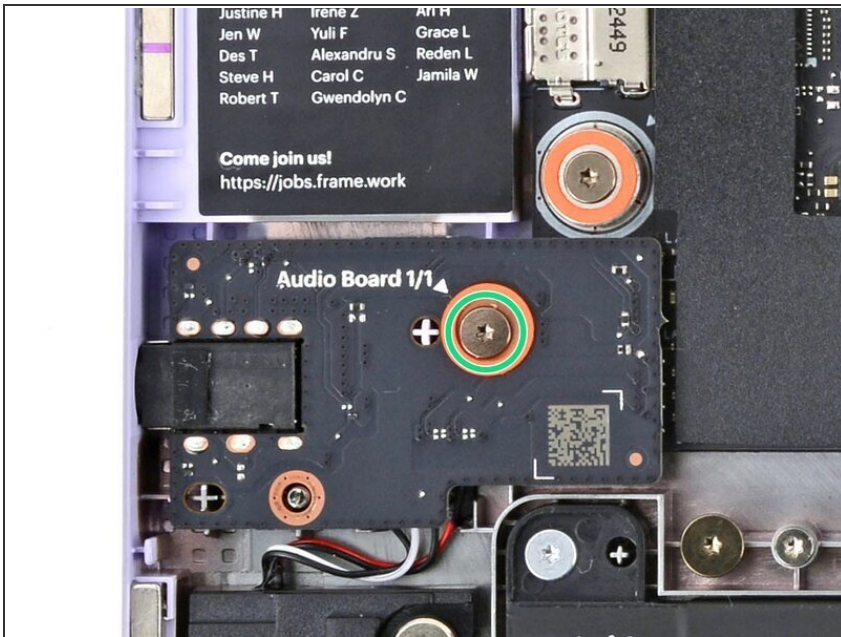
- Use your Framework Screwdriver to tighten the captive T5 Torx screw to secure the Power Button Board.
- ⓘ Tighten the screw until it's snug. Don't over-tighten it, or you may strip the screw.

Step 45 — Install the Audio Board



- Insert the Audio Board into the laptop at an angle to help align the headphone jack.
- Use the two plastic alignment pins on the laptop to help with final alignment.

Step 46



- Use your Framework Screwdriver to tighten the captive T5 Torx screw to secure the Audio Board.
- ⓘ Tighten the screw until it's snug. Don't over-tighten it, or you may strip the screw.

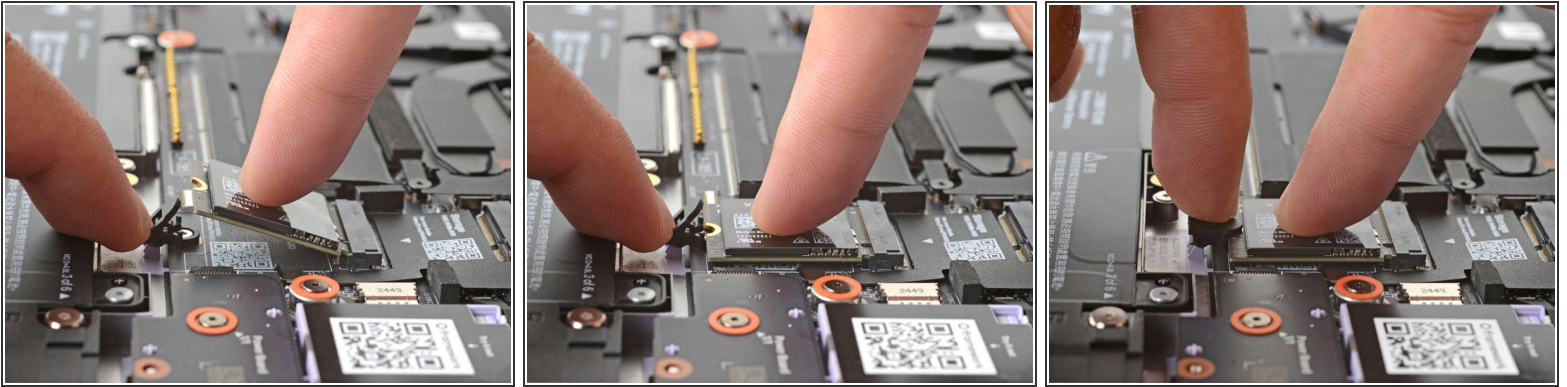
Step 47 — Install the SSD



⚠ Hold the SSD by its edges. Don't touch the gold contacts with your fingers . If you do, wipe the contacts with a clean, lint-free cloth to remove any finger oils.

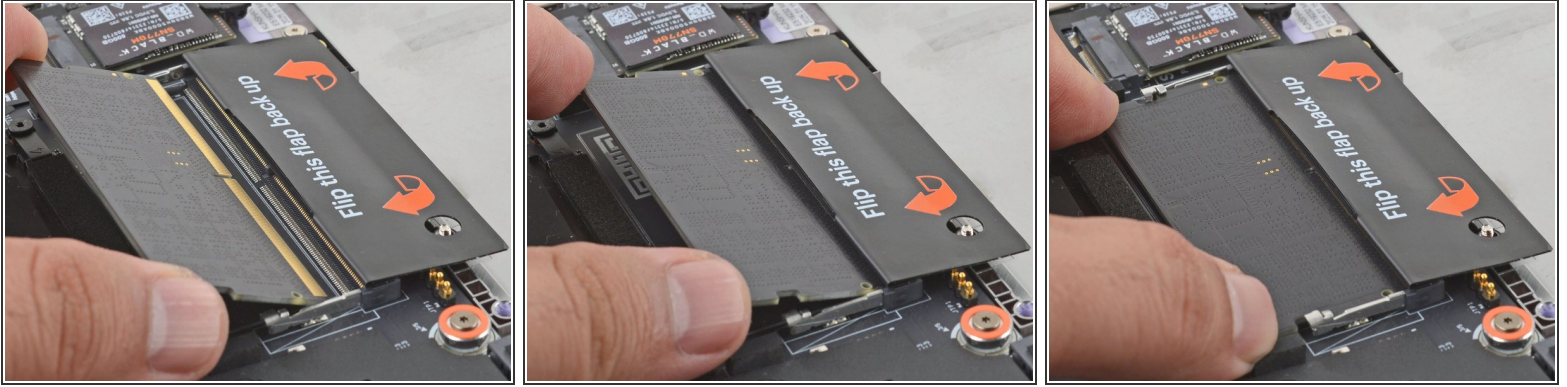
- Align the SSD's gold contacts with its socket.
- Insert the SSD into the socket at a shallow angle. The gold contacts should mostly be covered by the socket.
- ① The SSD fits into the socket in one orientation. If it doesn't feel like it fits, try flipping the module.

Step 48



- Use your finger to press down on the black SSD latch to keep it open.
- Use another finger to press the SSD down until it lays flat.
 - ⓘ If the SSD doesn't fit in the latch, you may need to insert the SSD further into its socket.
- Use your finger to close the latch to secure the SSD.
 - ⓘ You should hear a click, and the SSD should no longer pop up.

Step 49 — Install the Memory module



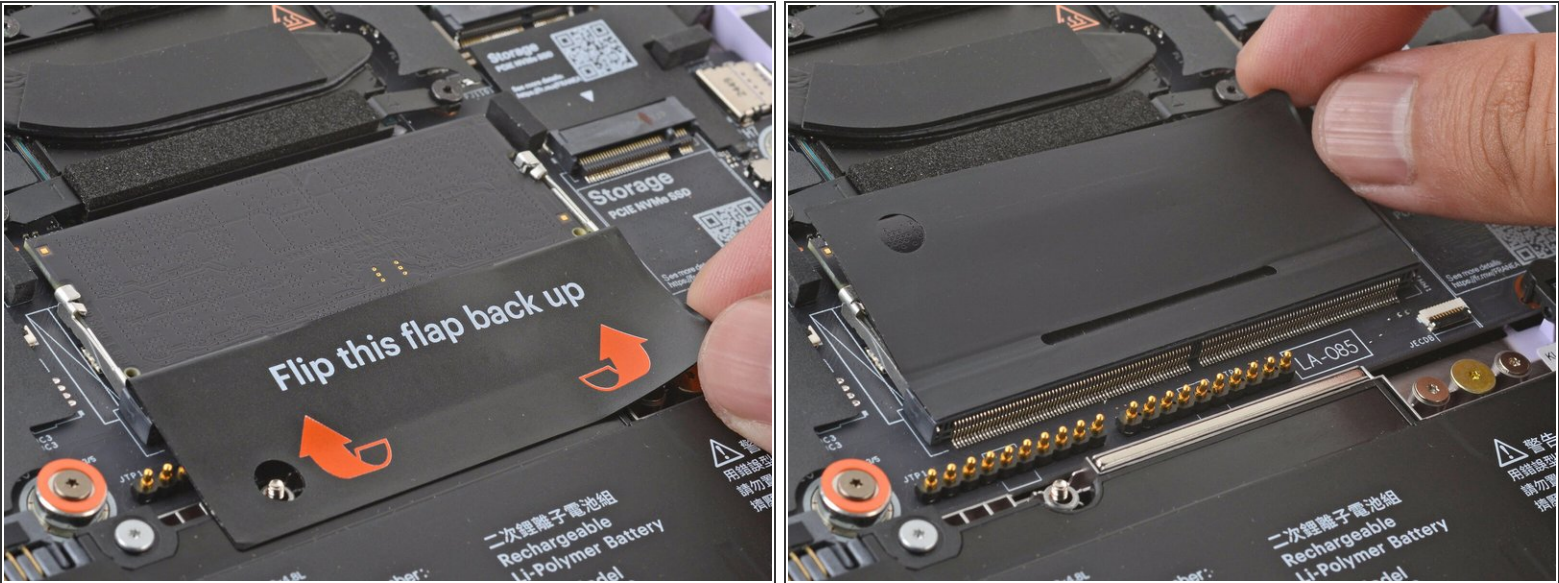
⚠ **Hold the memory module by its edges. Don't touch the gold contacts with your fingers . If you do, wipe the contacts with a clean, lint-free cloth to remove any finger oils.**

- Orient the module with the label facing down and align the gold contacts with the socket.
- Insert the contact edge into the socket at a shallow angle. The gold contacts should mostly be covered by the socket.

⚠ **Intel Core Series 3 Mainboards have the RAM flipped compared to these images. The shorter side of connectors will be on the left.**

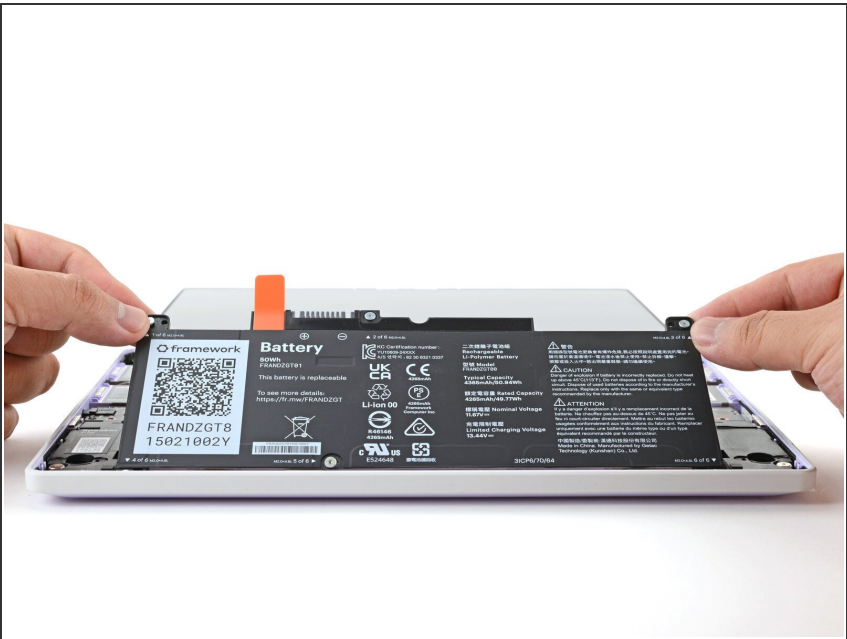
- Press the edges of the memory module down until the side clips lock it in place.

Step 50



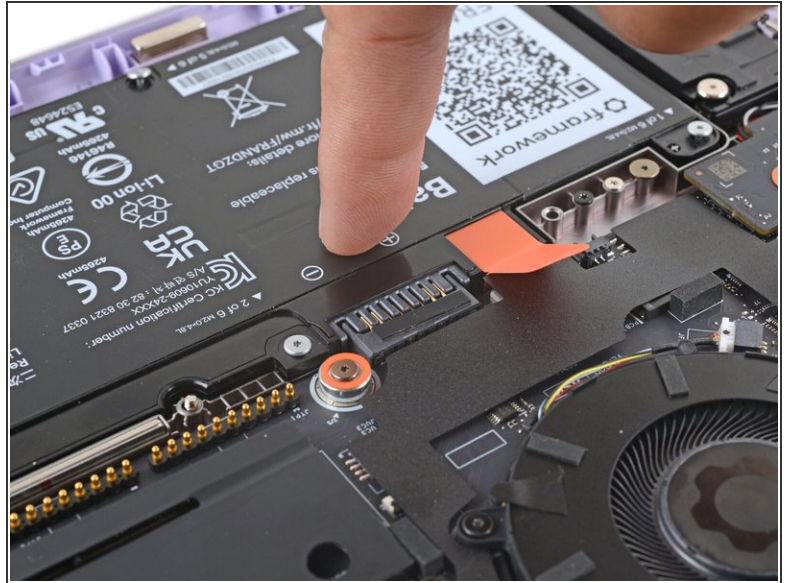
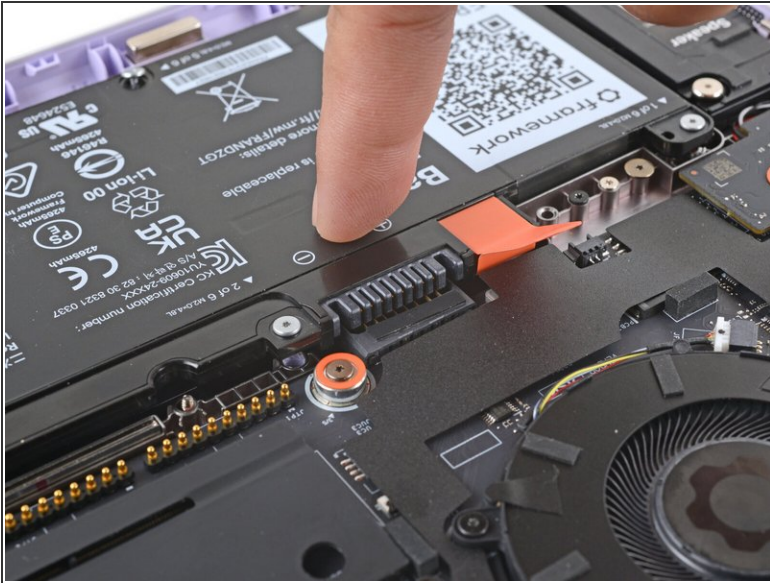
- Flip the memory flap back over the memory module.

Step 51 — Install the Battery



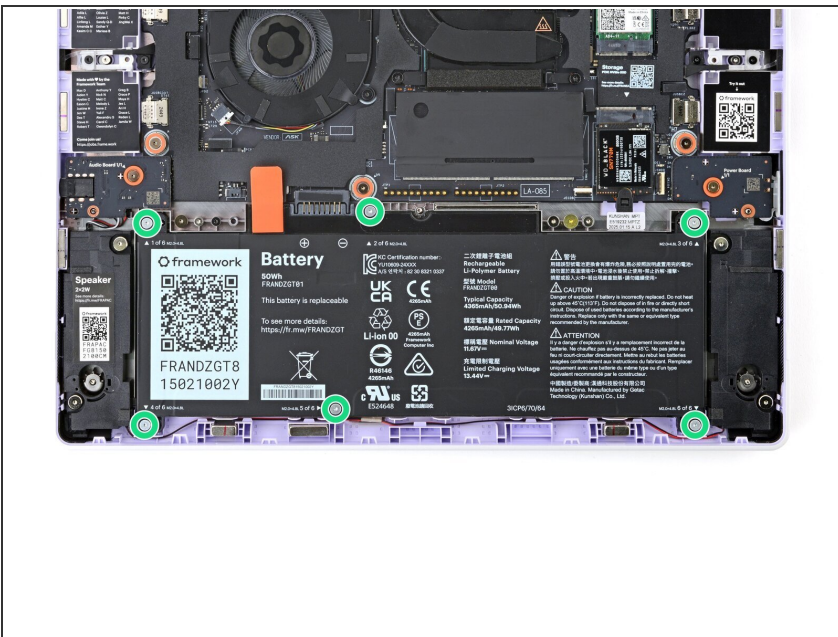
- Lay the battery in its recess in the laptop.

Step 52



- Use your finger to push the battery down near its connector to reconnect it.

Step 53



- Use your Framework Screwdriver to tighten the six captive T5 Torx screws to secure the battery.
- ⓘ Tighten the screws until they're snug. Don't over-tighten them, or you may strip the screws.

Step 54 — Install the Input Cover



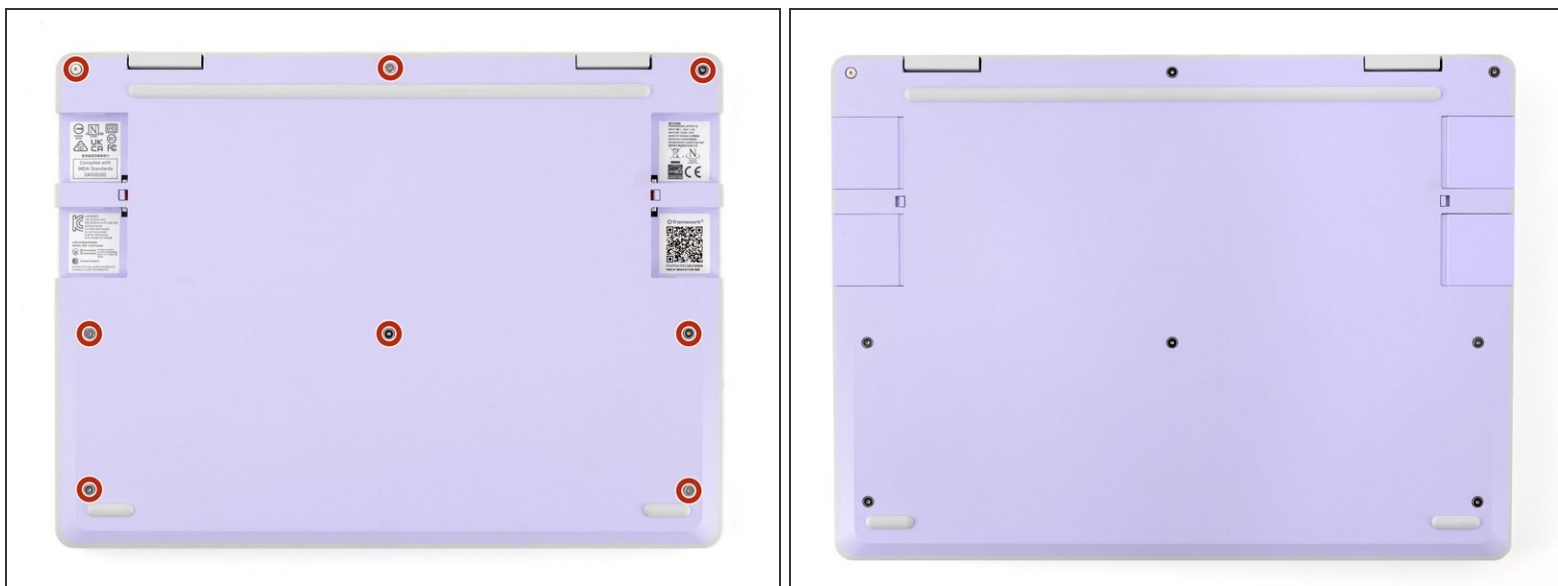
- Angle the bottom edge of the Input Cover towards the base of the Laptop.
- Align and insert the bottom edge of the Input Cover into the base of the Laptop.
 - ① Make sure the [slots along the bottom edge of the Input Cover](#) slide into the tabs in the base.
- Lower the Input Cover's top edge onto the laptop until the magnets snap it in place.
 - ① Make sure the Input Cover sits neatly within the laptop frame and no corners are popping up.

Step 55 — Close and flip your Laptop



- Close the Laptop lid.
- Flip your Laptop face-down on a clean work surface.

Step 56 — Tighten the bottom screws



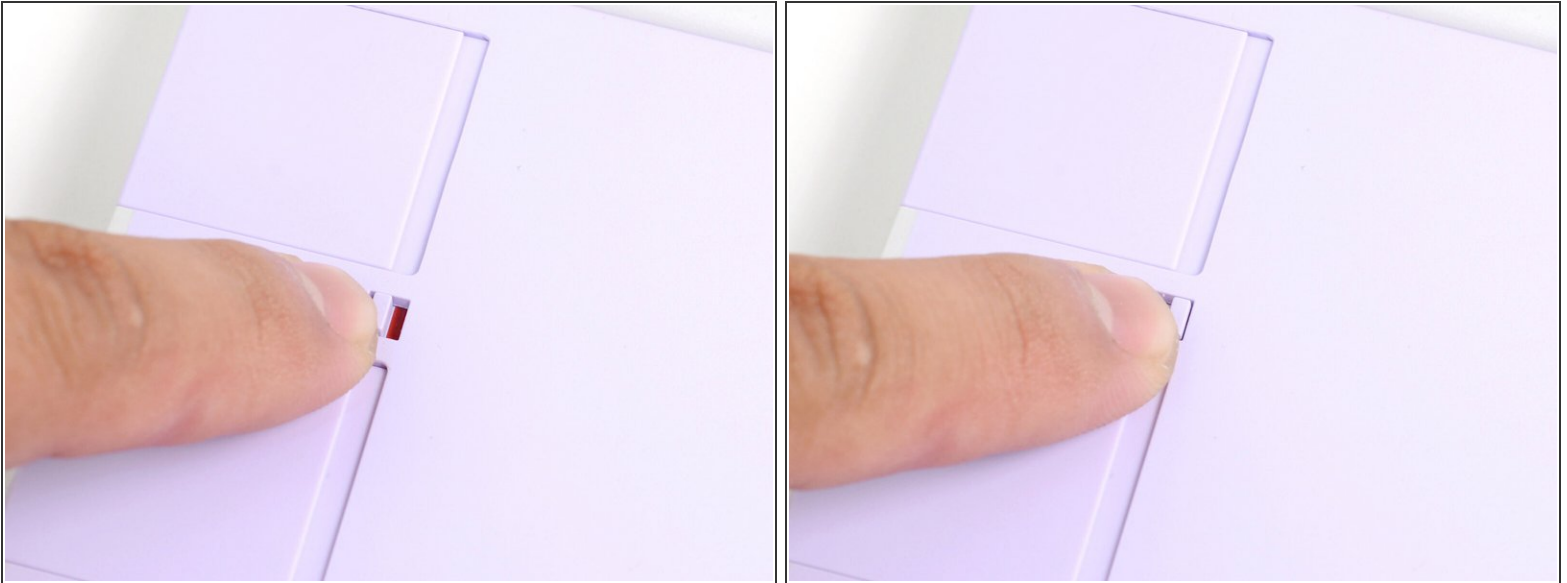
- Use your Framework Screwdriver to tighten the eight captive T5 Torx screws on the bottom of your Laptop.
 - ① Tighten the screws until they're snug. Don't over-tighten them, or you may strip the screws.

Step 57 — Install the Expansion Cards



- Slide each Expansion Card into its Expansion Card slot.

Step 58 — Lock the Expansion Card slots



- ① If there's a red bar showing under either Expansion Card latch, use your finger to flip the latch and lock the Expansion Card into its slot.
- ① Locking the Expansion Card slots helps keep the cards in place when you unplug cables from them.

You finished fixing your Framework Laptop! To update to the latest drivers, firmware, and software to ensure the full functionality, check out [this page](#).

Take your e-waste to an [R2 or e-Stewards certified recycler](#).

If you need help, [contact Framework support](#).