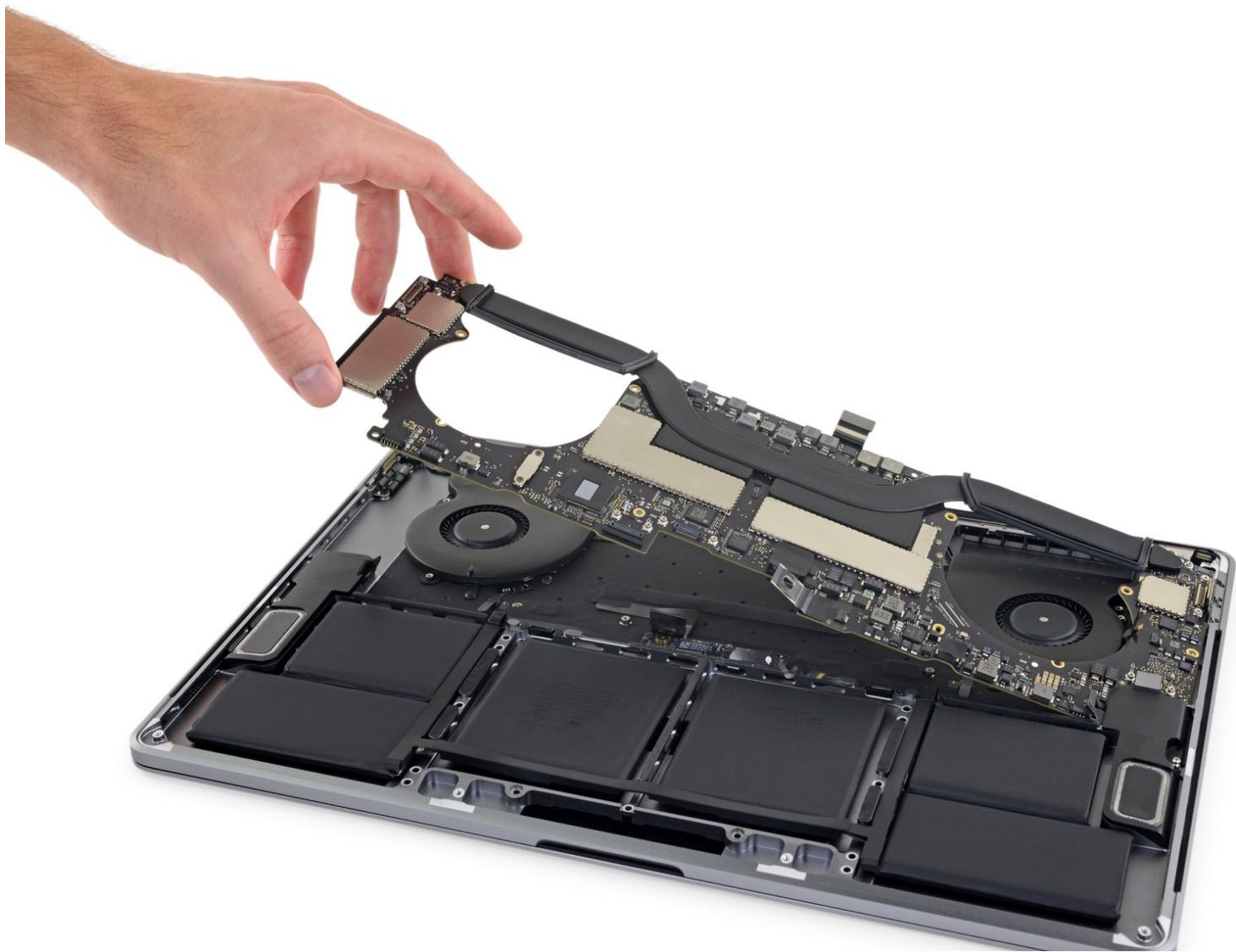




# MacBook Pro 15" Touch Bar Late 2016 Logic Board Assembly Replacement

Prerequisite-only guide for removing the logic board + heat sink together as an assembly.

Written By: Jeff Suovanen



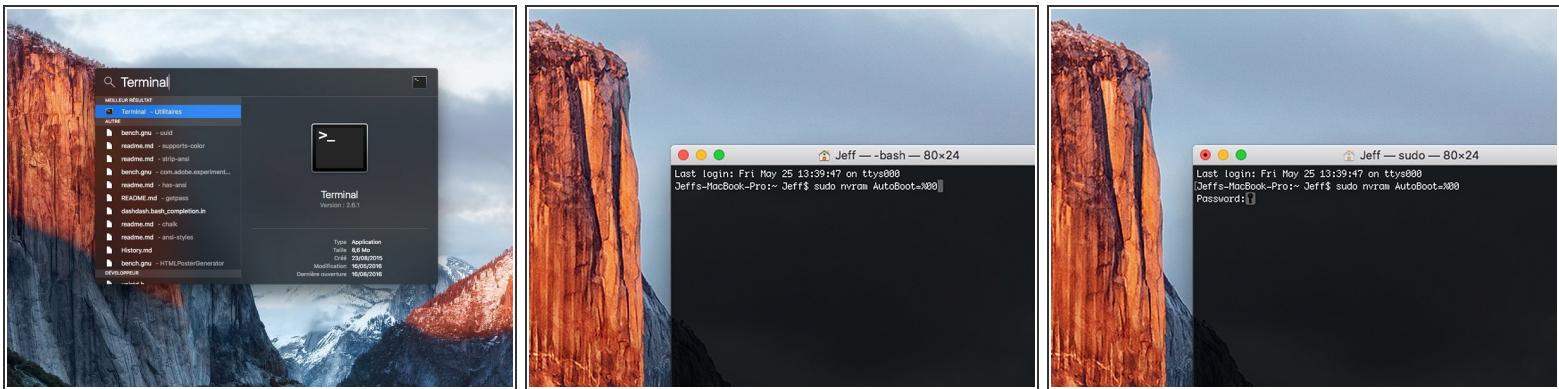
## INTRODUCTION

Prerequisite only. Follow this guide to remove the logic board and heat sink together as a single assembly, either for further disassembly or simply to get it out of the way.

### TOOLS:

- [P5 Pentalobe Screwdriver Retina MacBook Pro and Air \(1\)](#)
- [Suction Handle \(1\)](#)
- [iFixit Opening Picks set of 6 \(1\)](#)
- [T3 Torx Screwdriver \(1\)](#)
- [Spudger \(1\)](#)
- [Tweezers \(1\)](#)
- [T5 Torx Screwdriver \(1\)](#)
- [T8 Torx Screwdriver \(1\)](#)
- [iOpener \(1\)](#)

## Step 1 — Disable Auto Boot



ⓘ Before starting this procedure, you must disable your Mac's **Auto Boot** feature. Auto Boot powers on your Mac when you open the lid, and may be accidentally triggered during disassembly. [Use this guide](#) or follow the abbreviated instructions below to disable Auto Boot.

- Power on your Mac and launch **Terminal**.
- Copy and paste the following command (or type it exactly) into Terminal:
  - **sudo nvram AutoBoot=%00**
- Press **[return]**. If prompted, enter your administrator password and press **[return]** again. *Note: Your return key may also be labeled ↵ or "enter."*

ⓘ You can now safely power down your Mac and open the bottom case, without it accidentally powering on.

★ When your repair is complete and your Mac is successfully reassembled, re-enable Auto Boot with the following command:

- **sudo nvram AutoBoot=%03**

## Step 2 — Lower Case



**⚠** Completely power off and unplug your MacBook Pro before you begin. Close the display and flip the entire laptop upside-down.

- Use a P5 Pentalobe driver to remove six screws securing the lower case, of the following lengths:
  - Four 4.7 mm screws
  - Two 6.6 mm screws

**📌** Note the orientation of the screws as you remove them—they need to be reinstalled at a slight angle.

**📌** Throughout this repair, [keep track of each screw](#) and make sure it goes back exactly where it came from to avoid damaging your device.

## Step 3



- Press a suction handle into place near the front edge of the lower case, between the screw holes.
- Lift up on the suction handle just enough to open a small gap under the lower case.

## Step 4



- Slide the corner of an opening pick into the gap you just created underneath the lower case.
- Slide the opening pick around the nearest corner and then halfway up the side of the MacBook Pro.

**(i)** This releases the first of the hidden clips securing the lower case. You should feel and hear the clip pop free.

## Step 5



- Repeat the previous step on the opposite side, using your opening pick to release the second clip.

## Step 6



- Lift the front edge of the lower case (the side opposite the display hinge) just enough to slide your fingertips underneath and get a good grip on it.

- *i* Two additional hidden clips near the middle of the cover may pop free at this point, if they haven't already.

 Don't lift very far and don't try to remove the lower case yet.

## Step 7



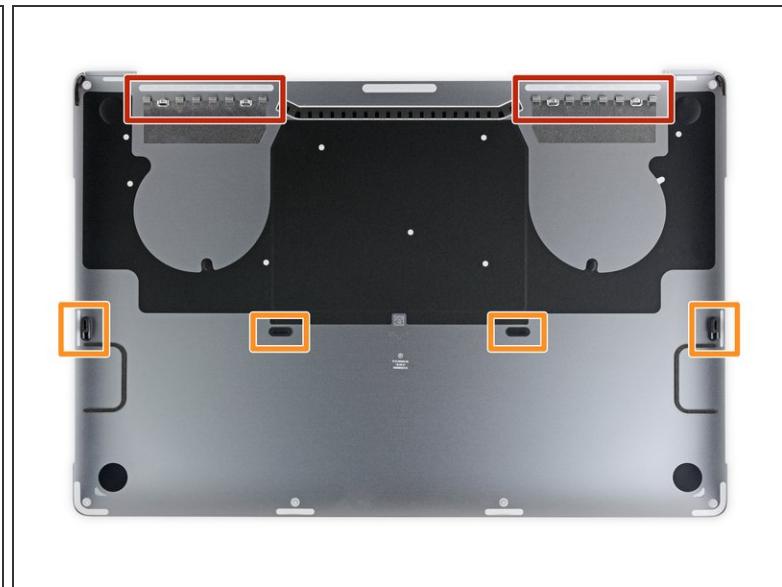
- Pull the lower case firmly towards the front of the MacBook (away from the hinge area) to separate the last of the clips securing the lower case.

- Pull first at one corner, then the other.

 Pull to the side—not up.

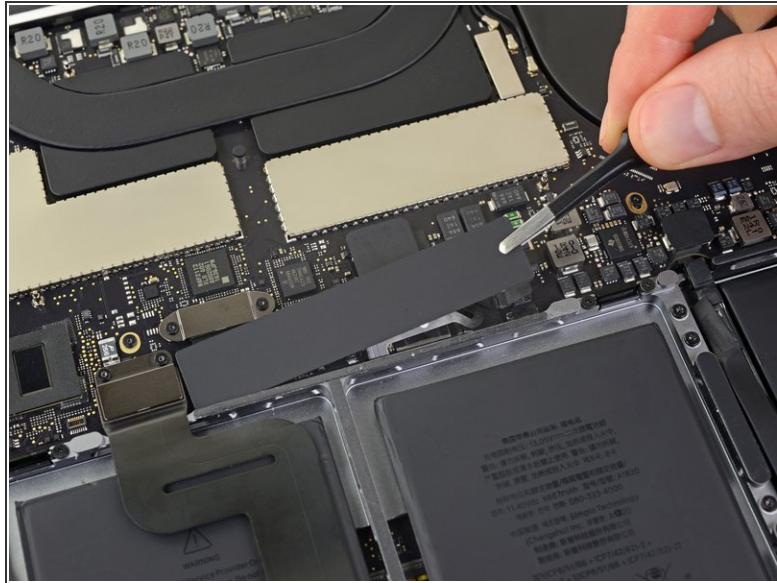
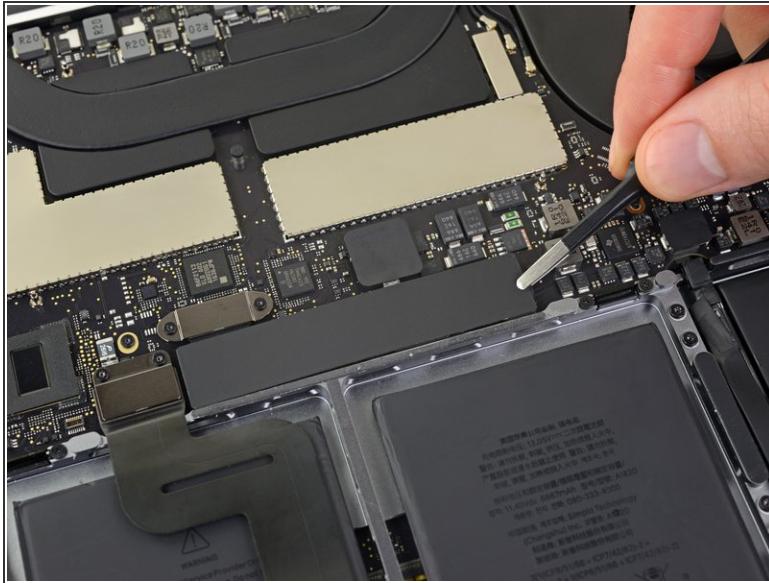
 This may require a lot of force.

## Step 8



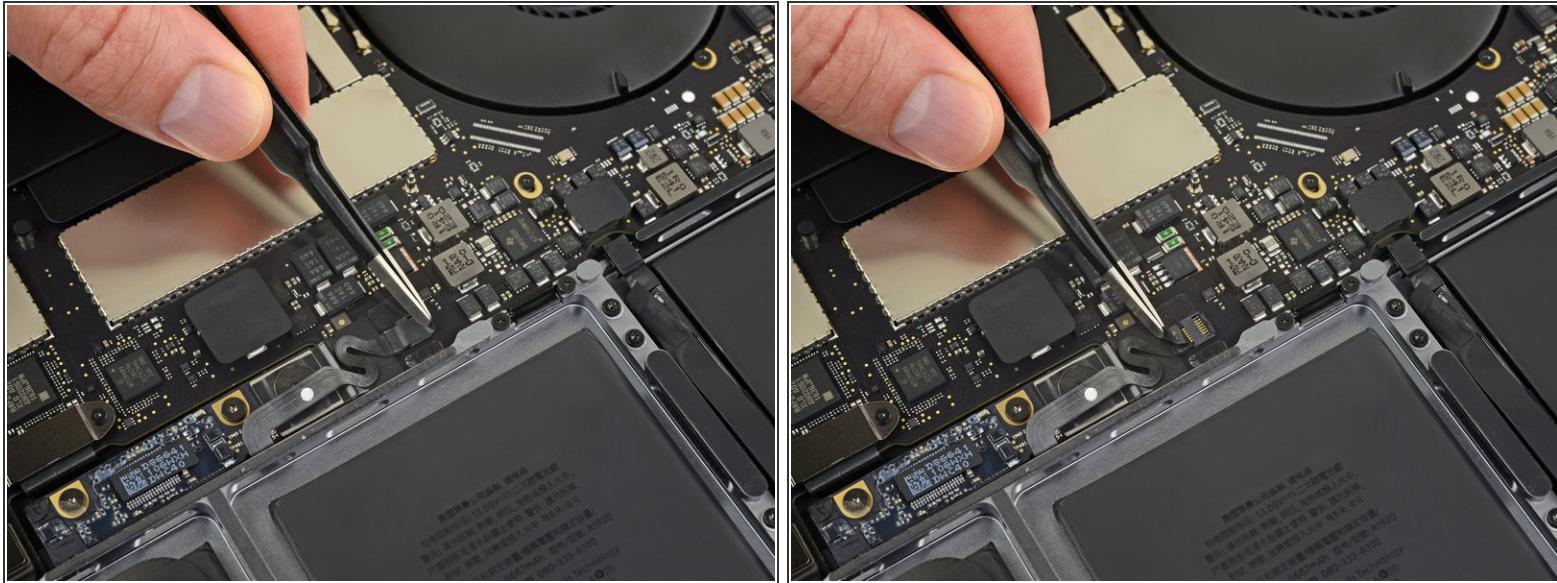
- Remove the lower case.
- ★ To reinstall the lower case:
  - Set it in place and align the sliding clips near the display hinge. Press down and slide the cover toward the hinge. It should stop sliding as the clips engage.
  - When the sliding clips are fully engaged and the lower case looks correctly aligned, press down firmly on the lower case to engage the four hidden clips. You should feel and hear them click into place.

## Step 9 — Battery Connector



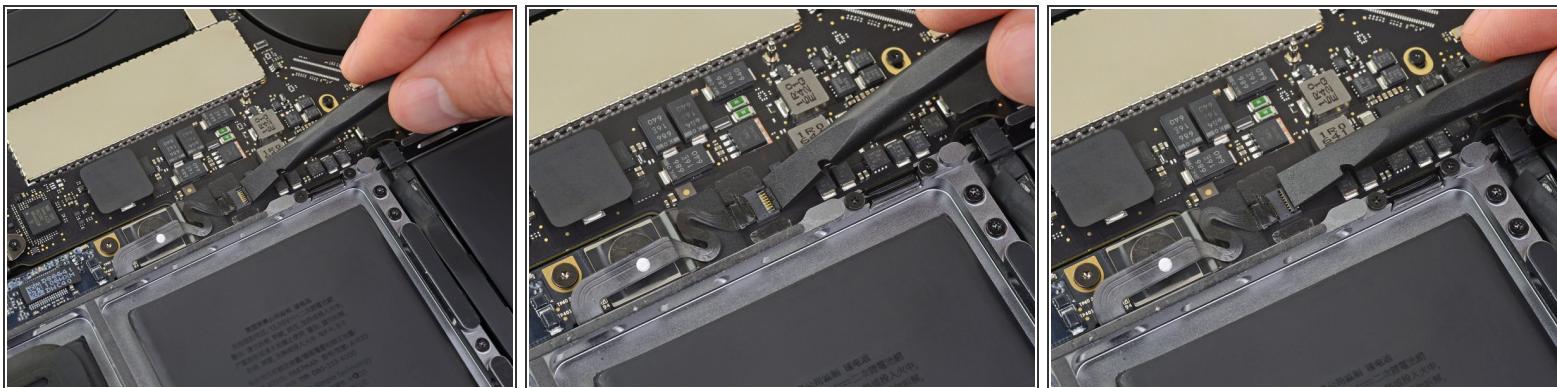
- Peel up and remove the large rectangular battery board cover, on the edge of the logic board nearest the battery.
  - If the cover doesn't peel up easily, apply mild heat with an iOpener, hair dryer, or heat gun to soften the adhesive underneath, and try again.
- ★ If the cover doesn't seat securely during reassembly, try rotating it 180 degrees. It must be oriented correctly in order for the adhesive pads underneath to contact the board screws.

## Step 10



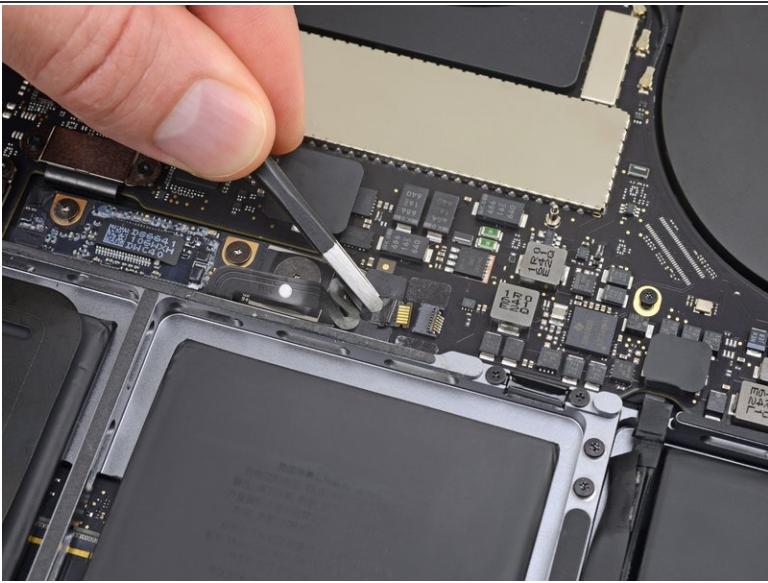
- Peel back the tape covering the battery board data cable connector.
- *(i)* The tape may not detach completely; just peel it back enough to access the connector.

## Step 11



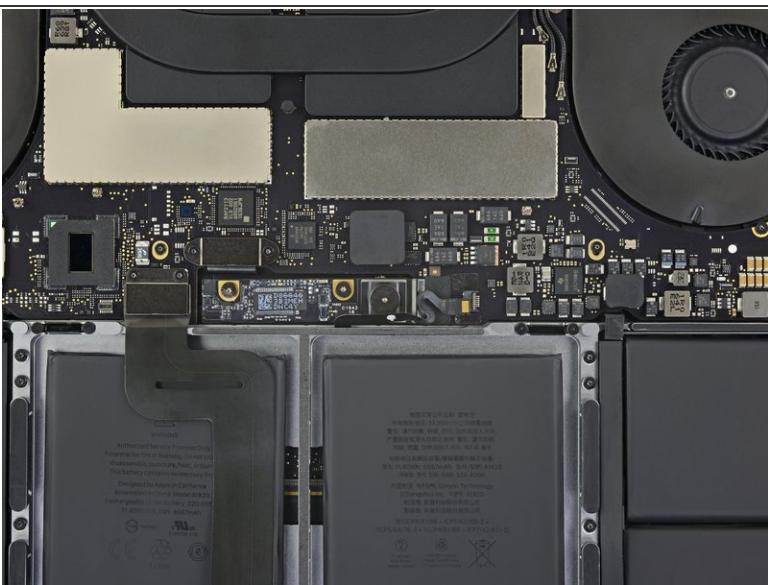
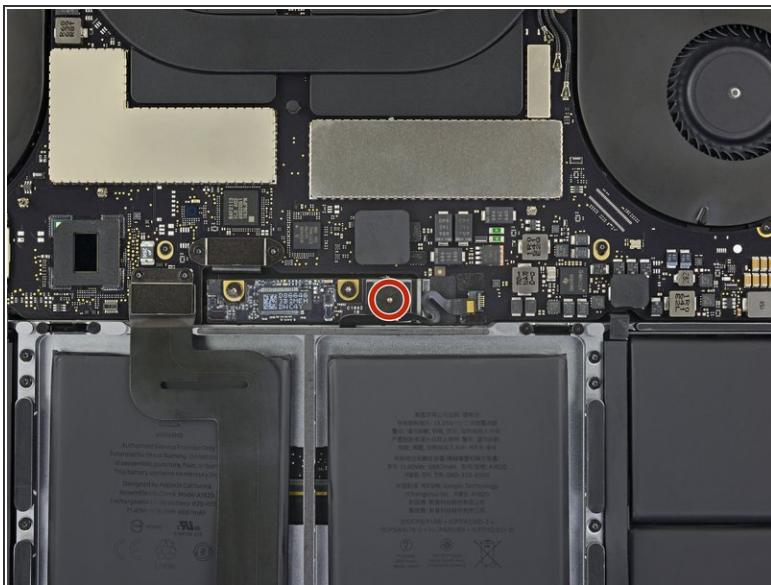
- Use a spudger to gently pry up the locking flap on the [ZIF connector](#) for the battery board data cable.

## Step 12



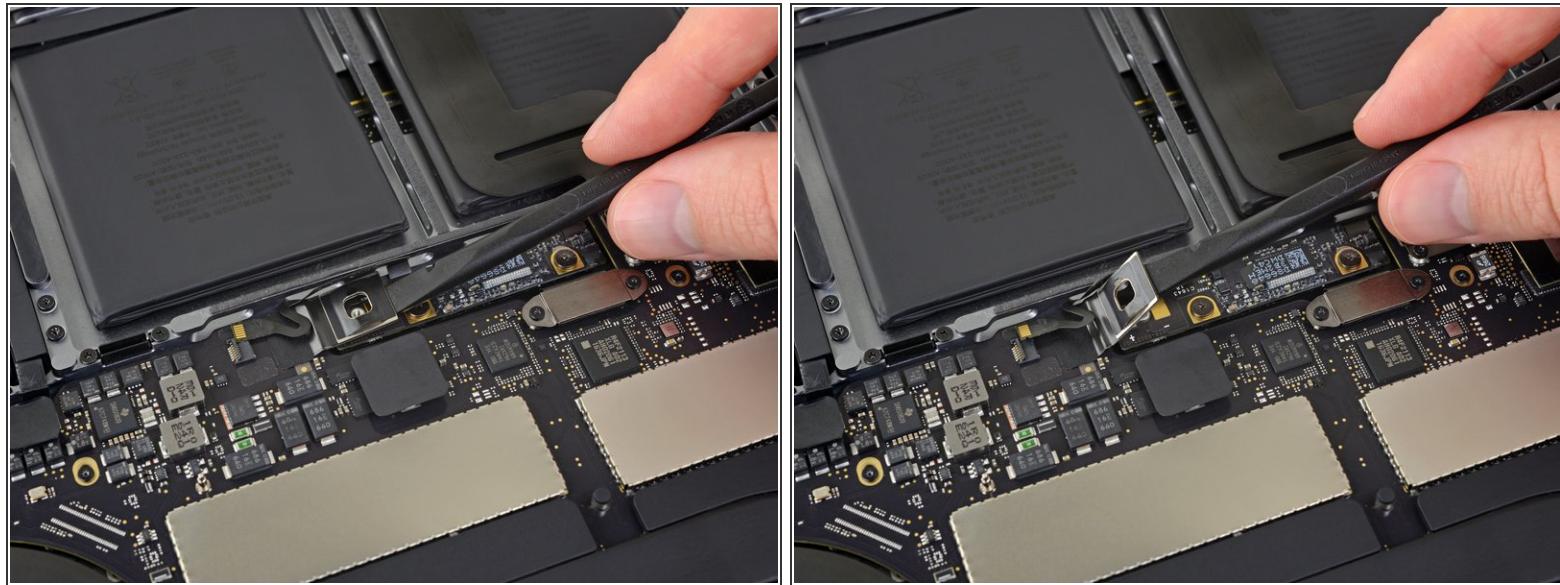
- Disconnect the battery board data cable by sliding it out from its socket.
- Slide parallel to the logic board, in the direction of the cable.

## Step 13



- Use a T5 Torx driver to remove the 3.7 mm pancake screw securing the battery power connector.

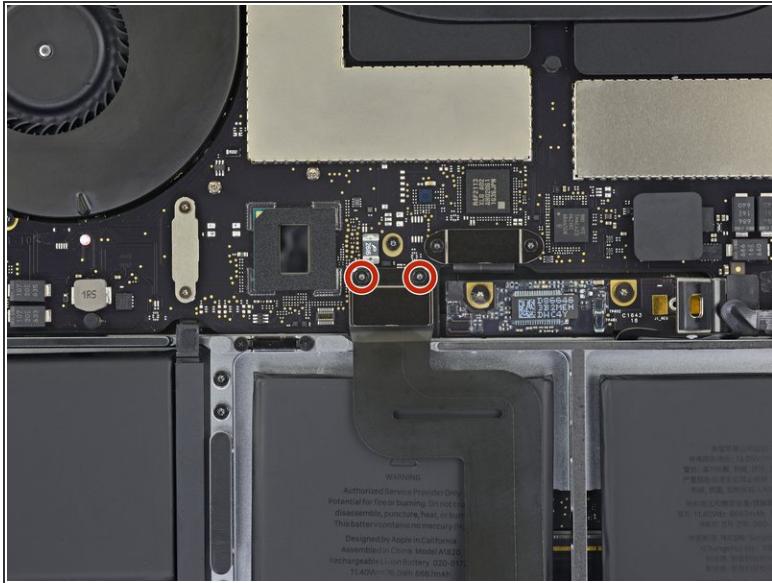
## Step 14



- Use a spudger to gently lift the battery power connector, disconnecting the battery.

**⚠** Lift the connector high enough to keep it separated from its socket while you work. If it accidentally makes contact, it could damage your MacBook Pro.

## Step 15 — Trackpad Assembly



- Use a T3 Torx driver to remove the two 1.9 mm screws securing the trackpad cable's cover bracket.
- Remove the bracket.

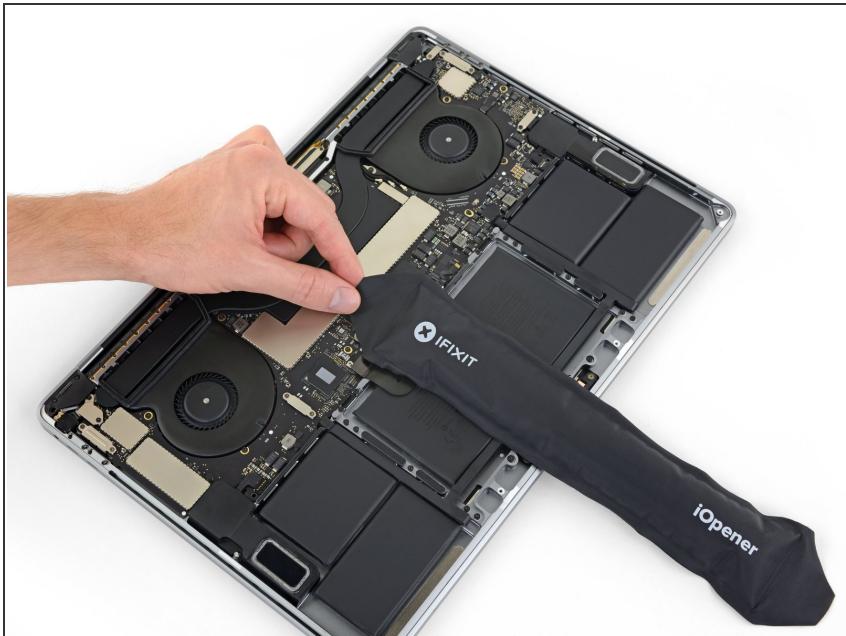
## Step 16



- Use a spudger to disconnect the trackpad cable by prying its connector straight up from the logic board.

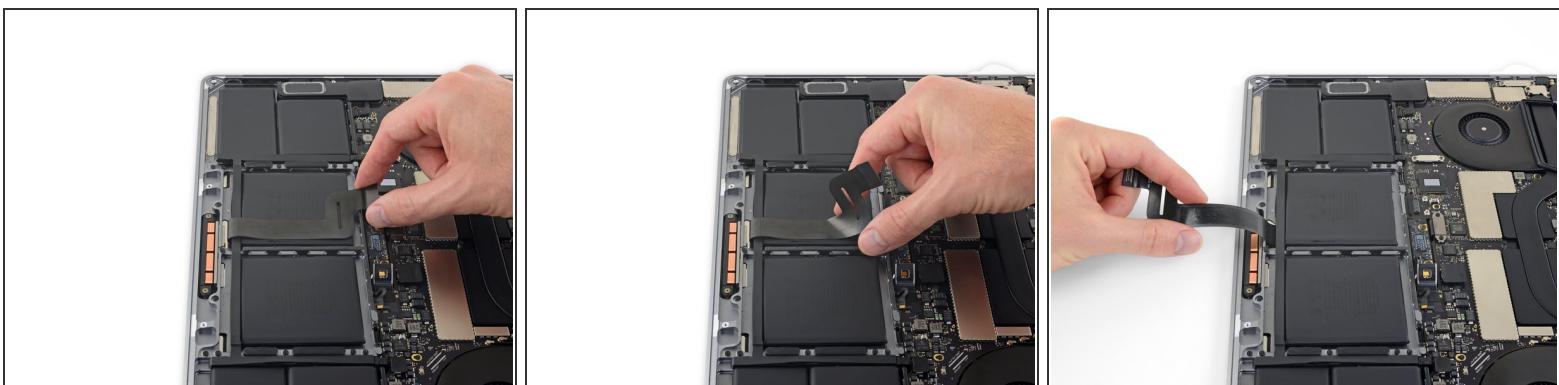
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## Step 17



- Apply mild heat to the trackpad ribbon cable to soften the adhesive securing it to the battery.
- You can use an iOpener, hair dryer, or heat gun, but be careful not to overheat the battery. The cable should be warm, but not too hot to touch.

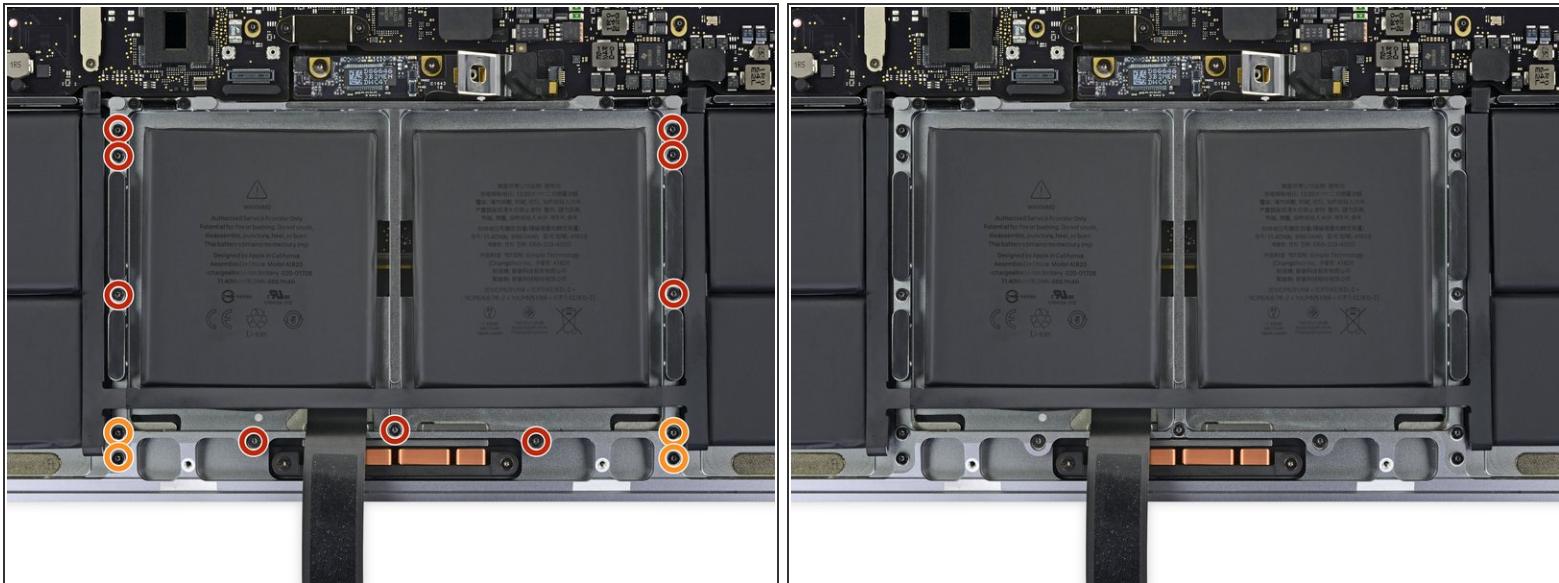
## Step 18



- Carefully peel the trackpad cable up off the battery, and push it out of the way.

**⚠** Don't fold or tear the cable. If you have trouble, don't force it—apply more heat and try again.

## Step 19



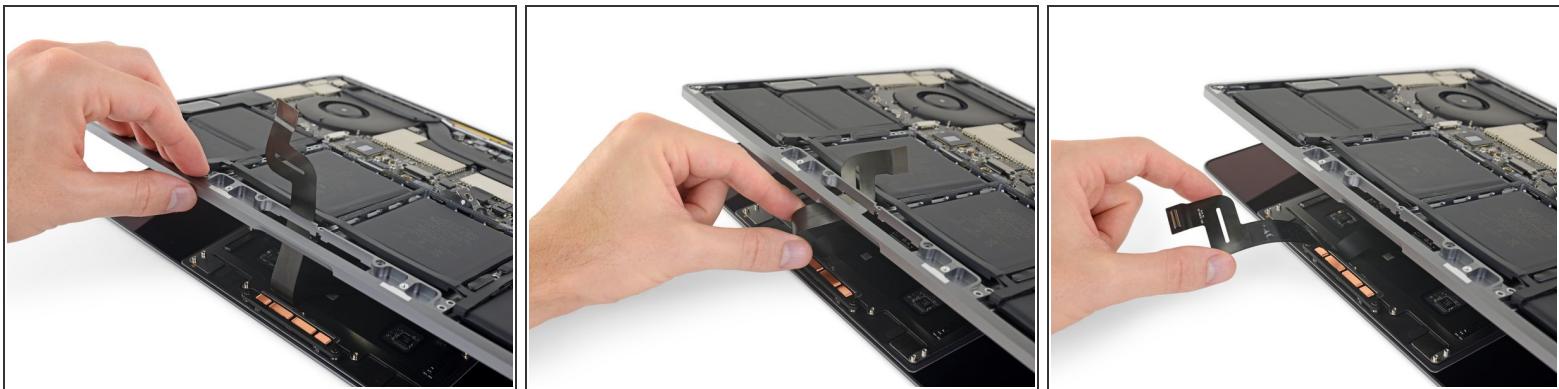
- Use a T5 Torx driver to remove the 13 screws securing the trackpad assembly:
  - Nine 5.8 mm screws
  - Four 4.9 mm screws

★ These screws look very similar, so don't mix them up.

★ These screws can loosen over time due to the clicking action on the Force Touch trackpad. Adding a little blue threadlocker as you install them can help keep them secure.

★ Install the screws loosely and check the trackpad alignment before tightening them down.

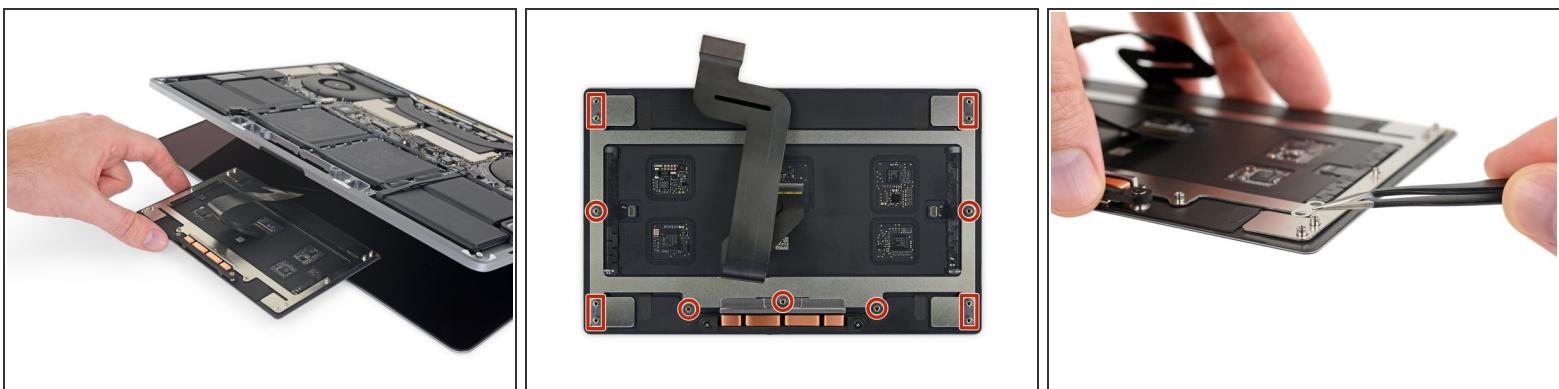
## Step 20



- Swing the display open slightly, but keep the MacBook upside-down. The trackpad assembly should separate and lay flat on the display.
- Gently feed the trackpad's ribbon cable through its slot in the chassis.

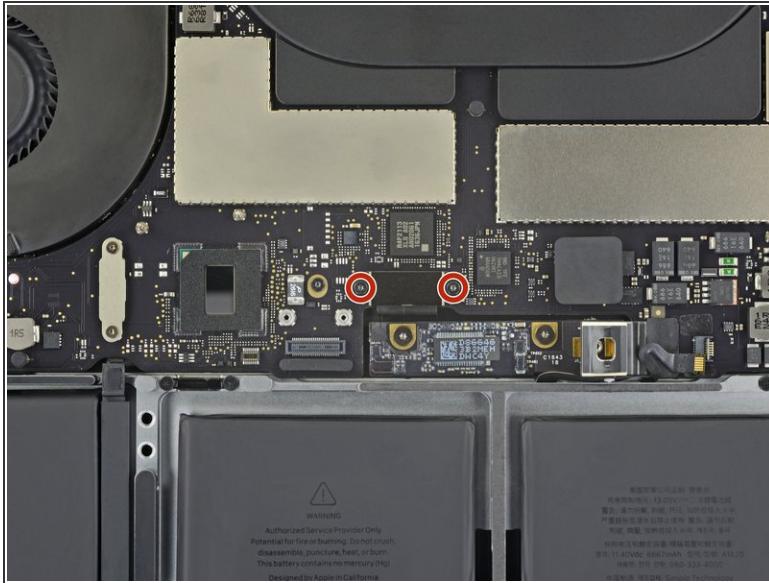
★ Carefully note the correct slot for the trackpad cable during reassembly—it goes through the narrow slot alongside the battery, not the bigger slot near the MacBook Pro's front edge.

## Step 21



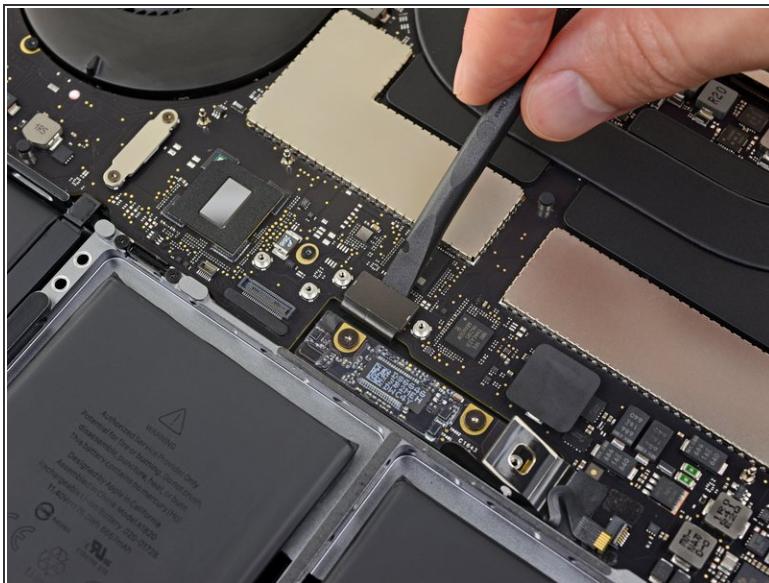
- As you remove the trackpad assembly, be very careful not to lose the nine small metal washers resting on the screw posts. (They will fly off and get lost with very little provocation.)
- Remove the trackpad assembly.

## Step 22 — Logic Board Assembly



- Using a T3 Torx driver, remove the two 1.9 mm screws securing the keyboard connector cover bracket.
- Remove the bracket.

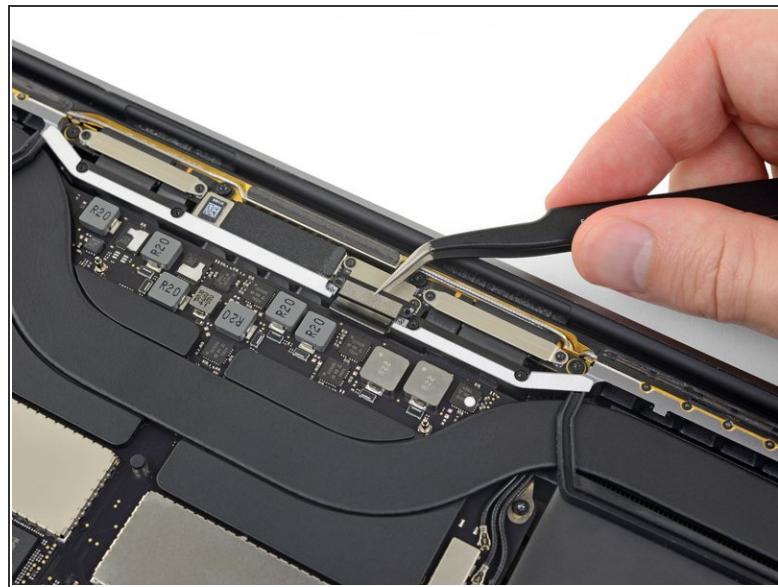
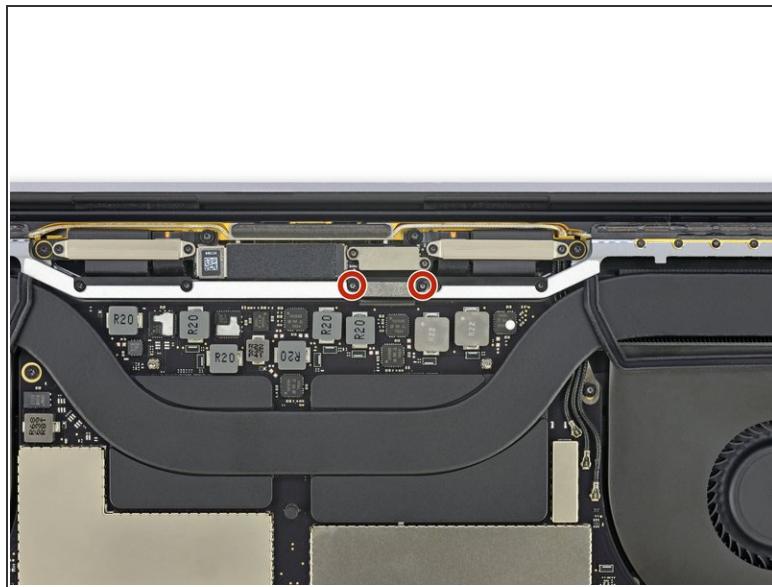
## Step 23



- Use your spudger to disconnect the keyboard by prying its connector straight up from the logic board.

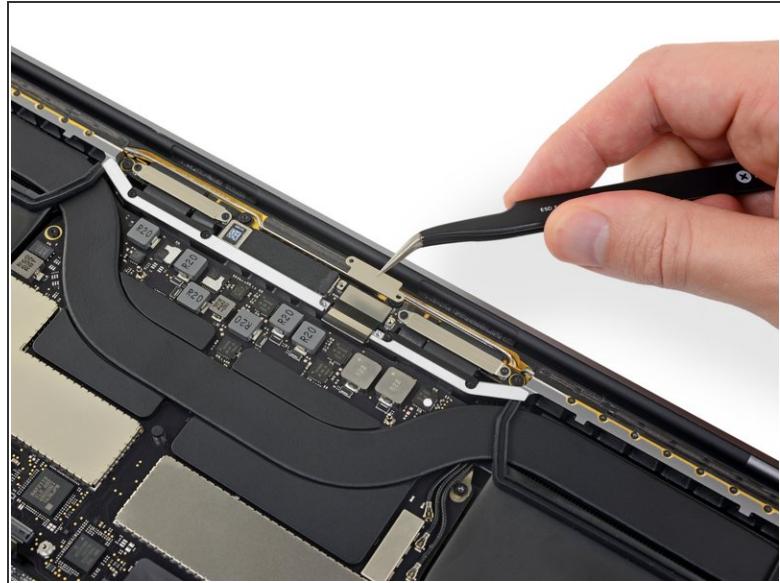
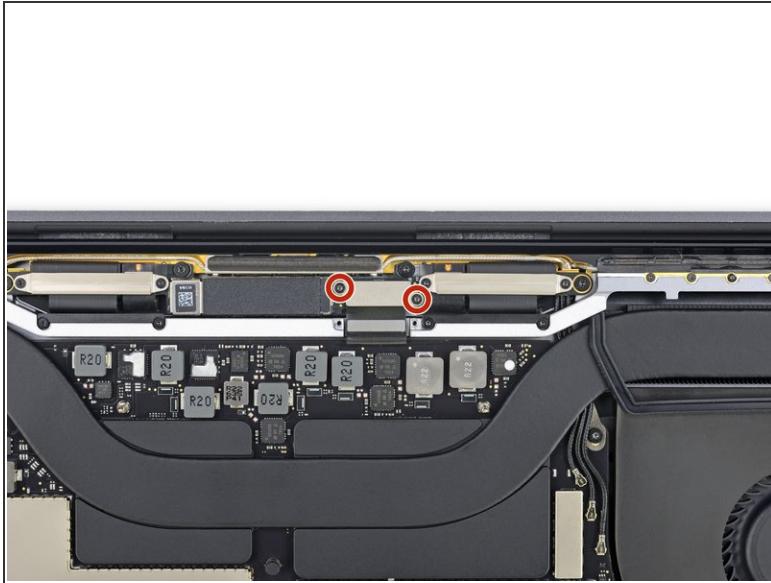
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## Step 24



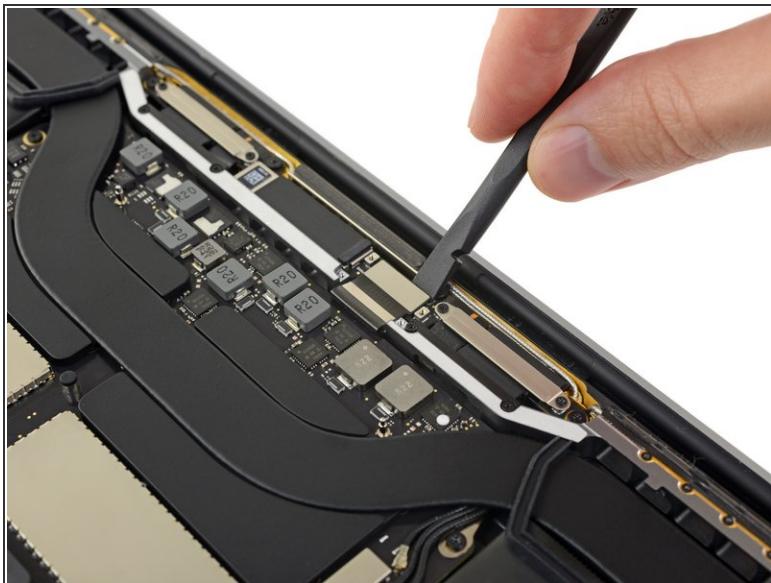
- Use a T3 Torx driver to remove the two 3.5 mm screws securing the cover on the display board flex cable.
- Remove the display board flex cable cover.

## Step 25



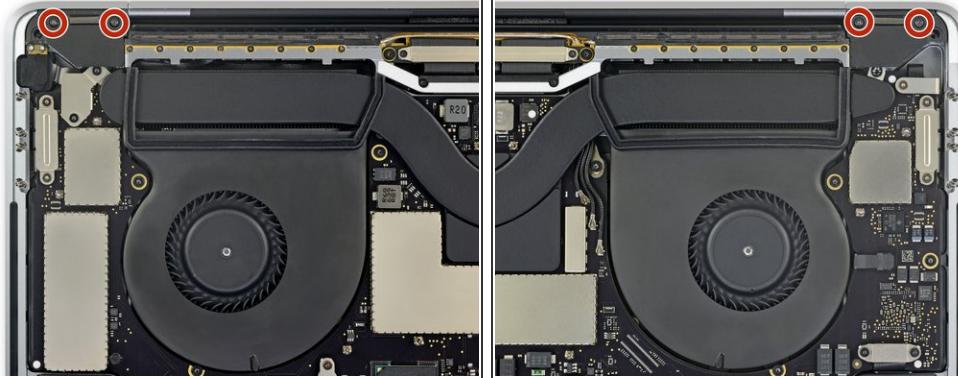
- Use a T3 Torx driver to remove the two 1.7 mm screws securing the bracket for the display board cable connector.
- Remove the bracket from the display board cable connector.

## Step 26



- Pry straight up with your spudger to disconnect the display board flex cable.

## Step 27



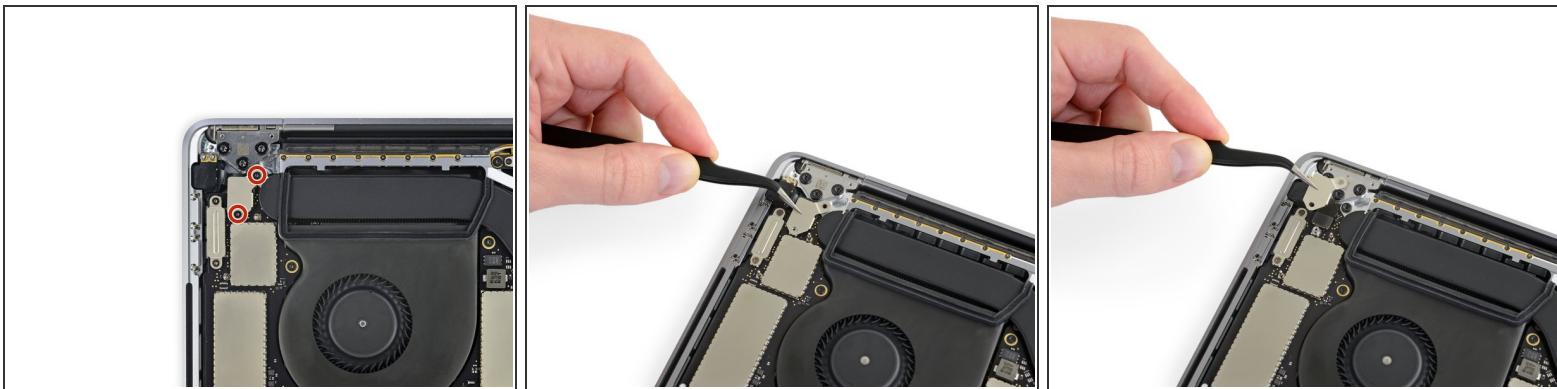
- Use a T3 Torx driver to remove the two 2.0 mm screws securing each hinge cover (four screws total).

## Step 28



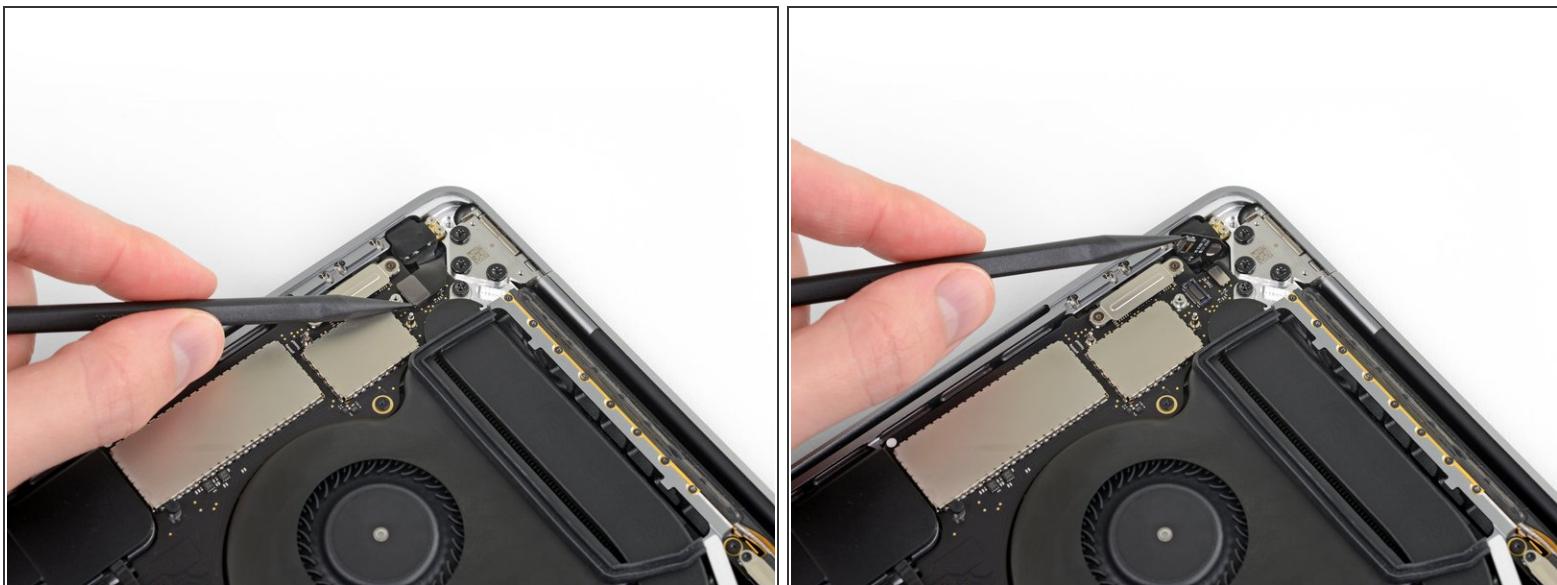
- Remove both hinge covers.

## Step 29



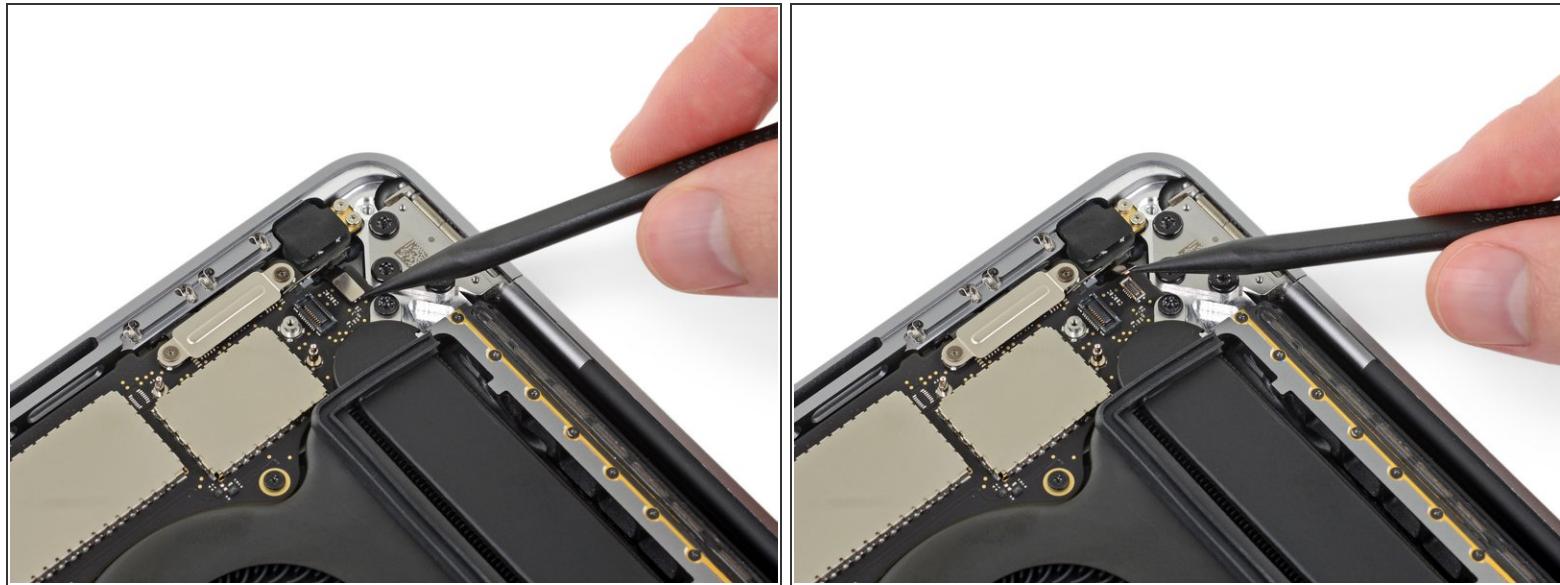
- Use a T3 Torx driver to remove the two 2.4 mm screws securing the cover bracket for the Touch ID and headphone jack cable connectors.
- Remove the bracket.

## Step 30



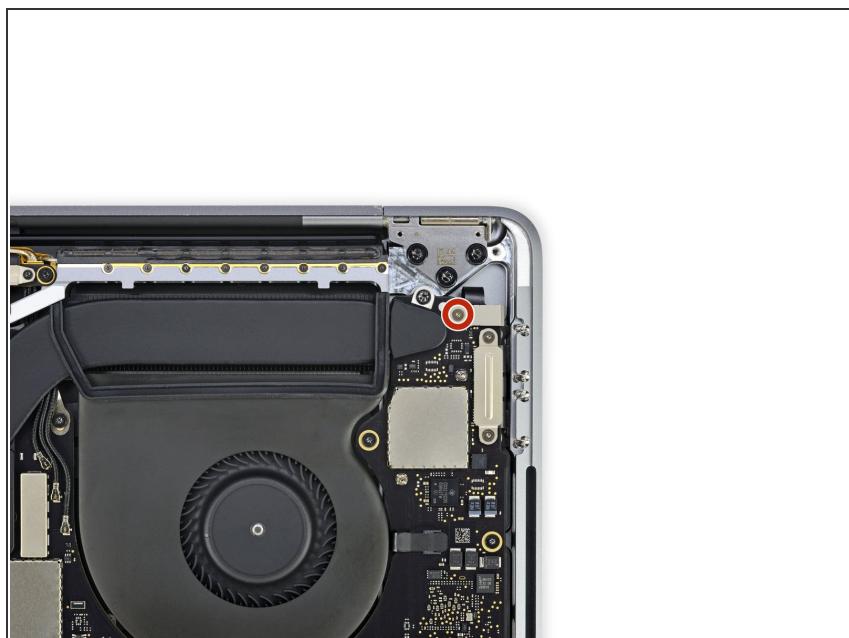
- Disconnect the headphone jack cable by prying its connector straight up from the logic board.

## Step 31



- Disconnect the power button and Touch ID sensor by prying its connector straight up from the logic board.

## Step 32



- Use a T3 Torx driver to remove the 1.3 mm screw securing the cover bracket for the Touch Bar digitizer connector.

## Step 33



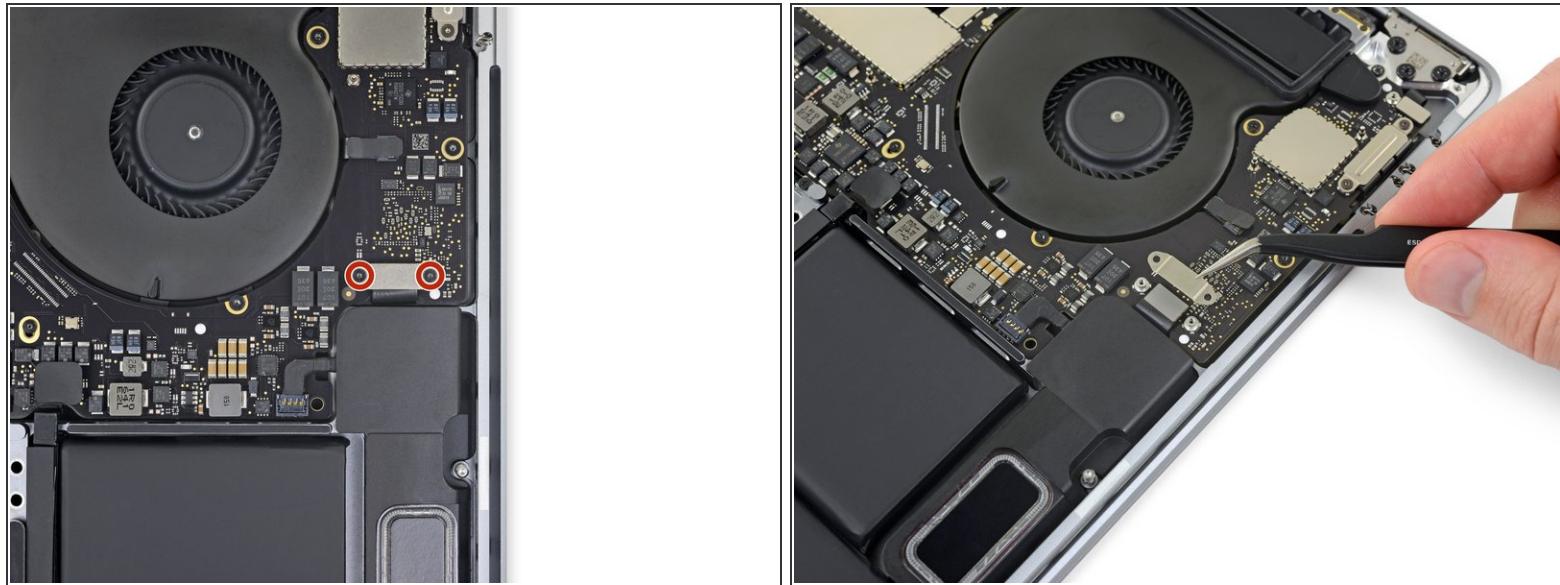
- Using your tweezers, slide the bracket toward the side edge of the MacBook Pro until it clears the slotted retaining tab on the logic board.
- Remove the bracket.

## Step 34



- Disconnect the Touch Bar digitizer cable by prying it straight up from the logic board.

## Step 35



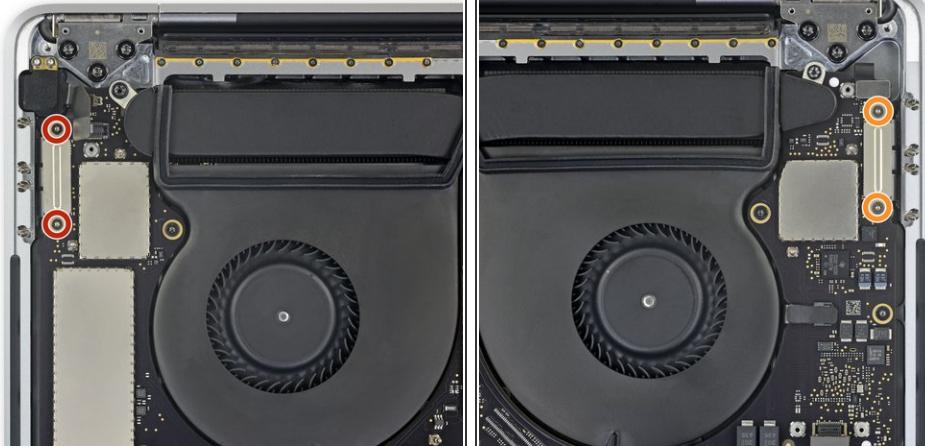
- Use a T3 Torx driver to remove the two 1.9 mm screws securing the bracket for the Touch Bar display cable connector.
- Remove the bracket.

## Step 36



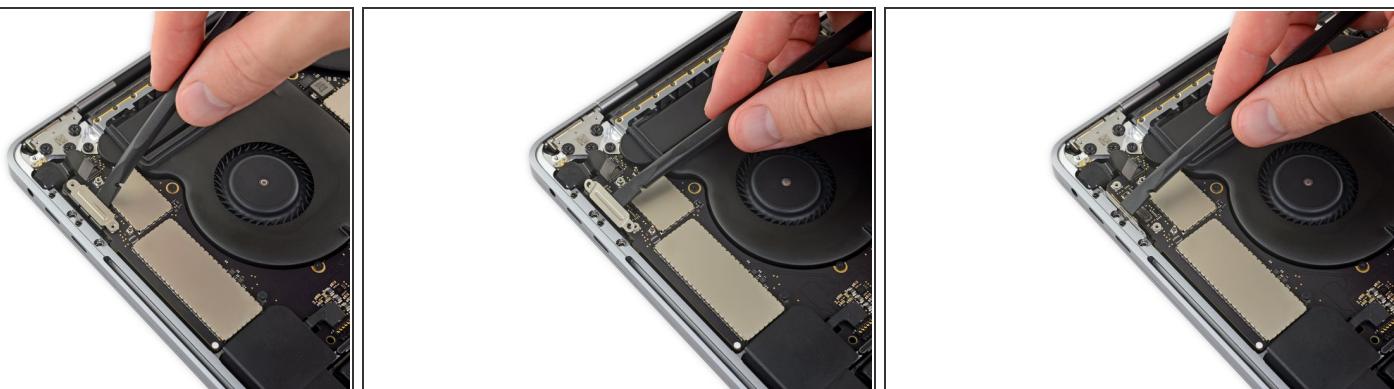
- Disconnect the Touch Bar display cable by prying its connector straight up from the logic board.

## Step 37



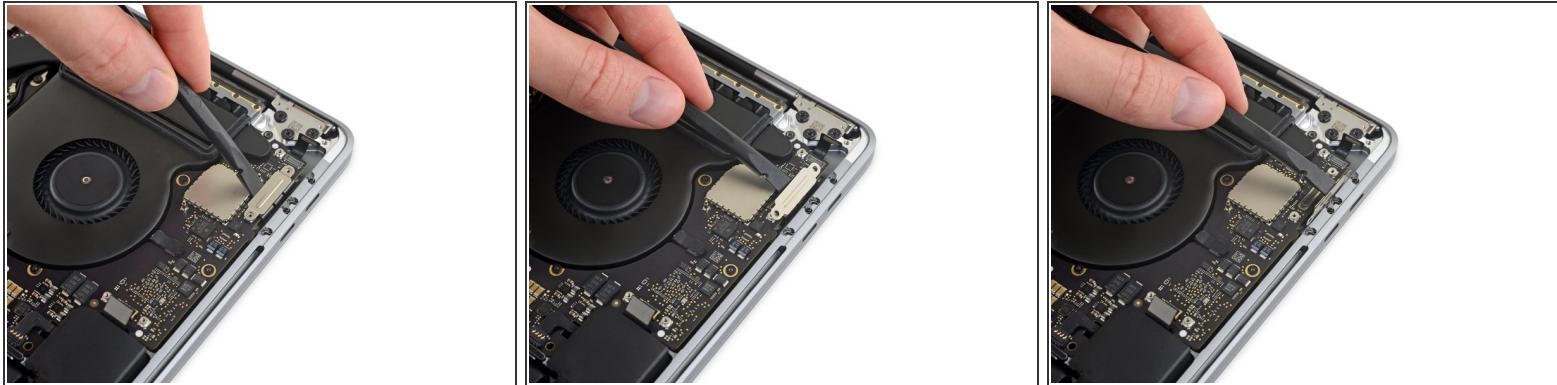
- Use a T3 Torx driver to remove the four 1.3 mm screws securing the Thunderbolt flex cable covers:
  - Two screws on the left
  - Two more on the right

## Step 38



- Disconnect the left-side Thunderbolt flex cable by prying it straight up from the logic board.
  - Pry from the inside edge, nearest the fan.
- Gently push the flex cable connector off to the side so it doesn't interfere with logic board removal.

## Step 39



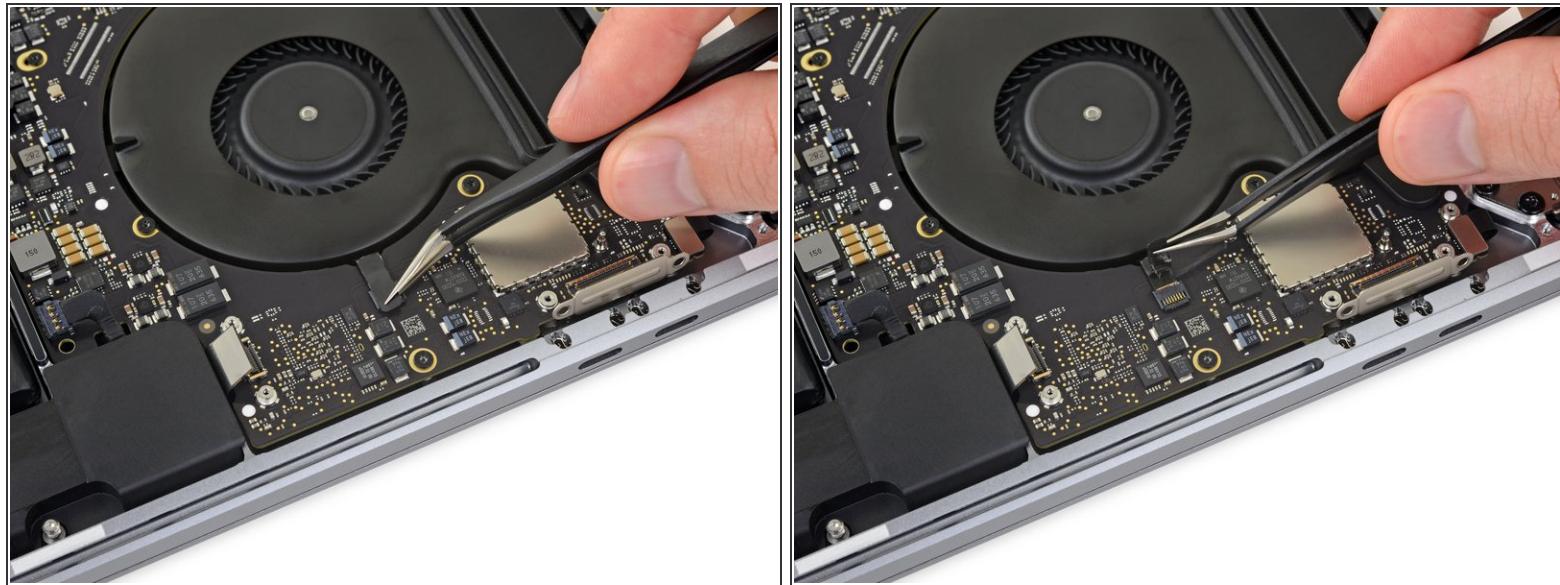
- Repeat to disconnect the Thunderbolt flex cable connector on the opposite side.
- Carefully push the flex cable connector aside so there's clearance for the logic board to come out without snagging.

## Step 40



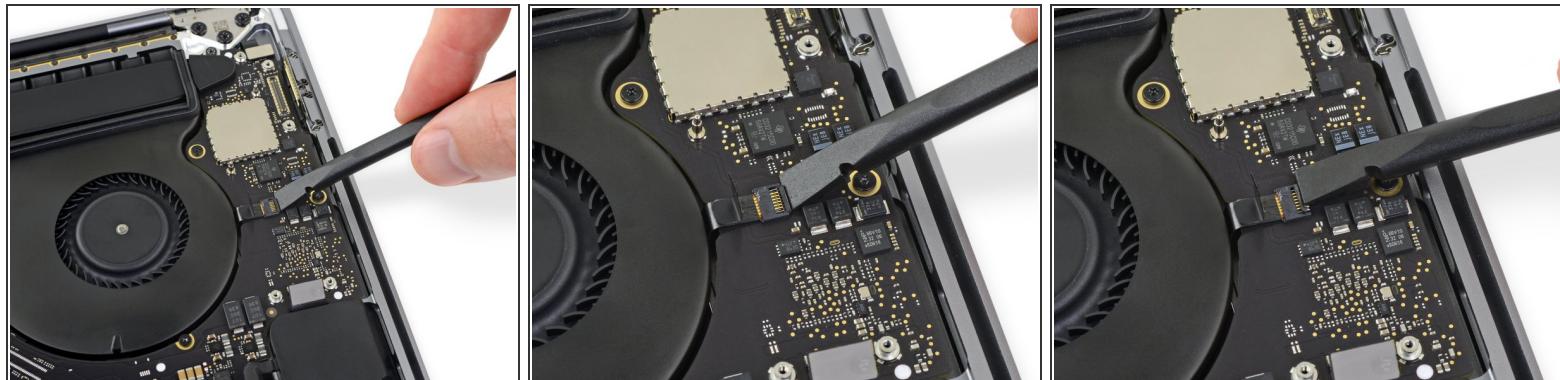
- Disconnect the two speaker connectors by sliding the flat end of your spudger underneath each cable near its connector.
- Gently twist or pry up to disconnect both speakers.

## Step 41



- Peel up any tape covering the microphone cable connector socket.

## Step 42



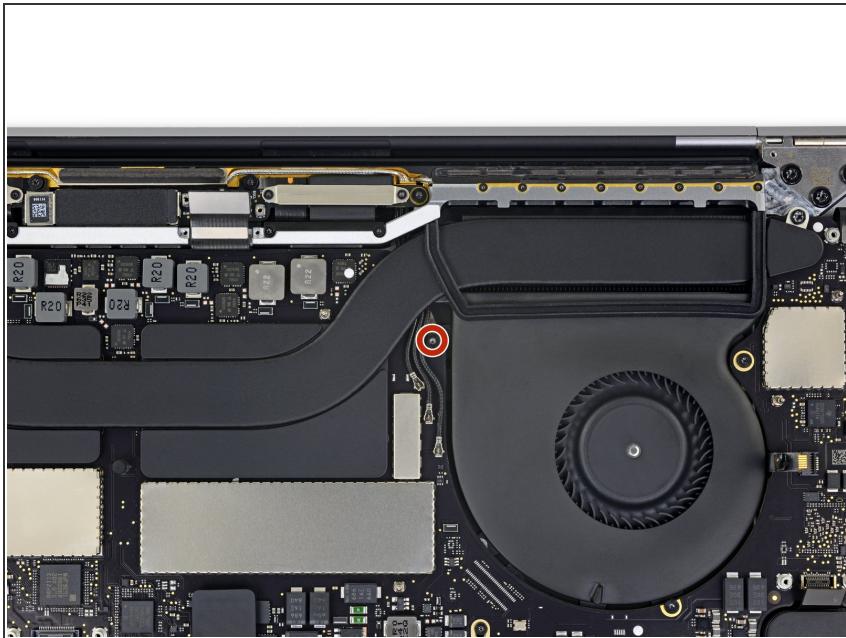
- Open the locking flap on the microphone cable's ZIF connector by prying it straight up from the logic board.

## Step 43



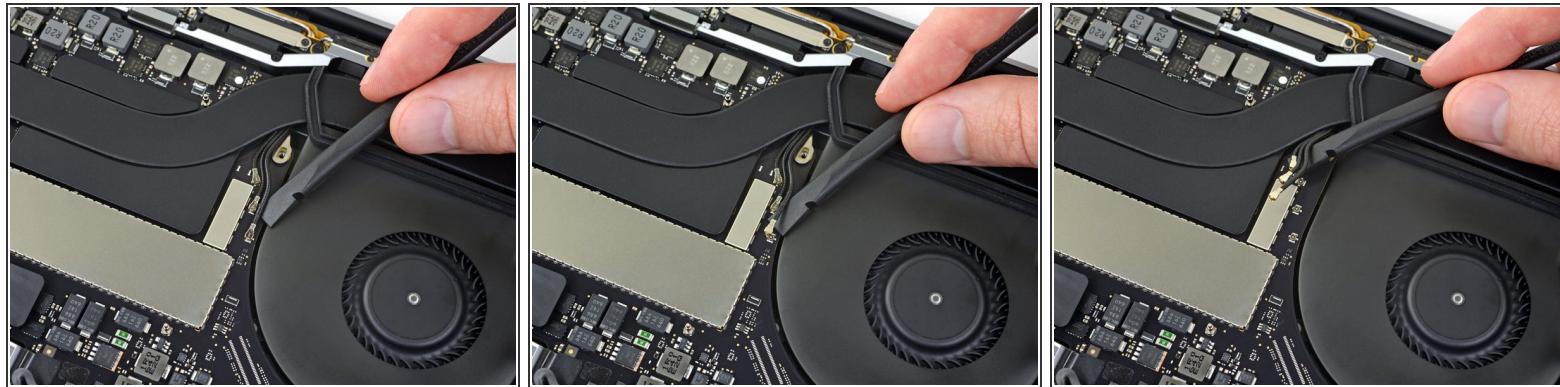
- Disconnect the microphone by pulling its cable toward the fan until it releases from its socket.
- If possible, pull on the tape attached to the cable, rather than the cable itself, to reduce the risk of damage.

## Step 44



- Use a T5 Torx driver to remove the single 2.9 mm screw securing the antenna cable bundle.

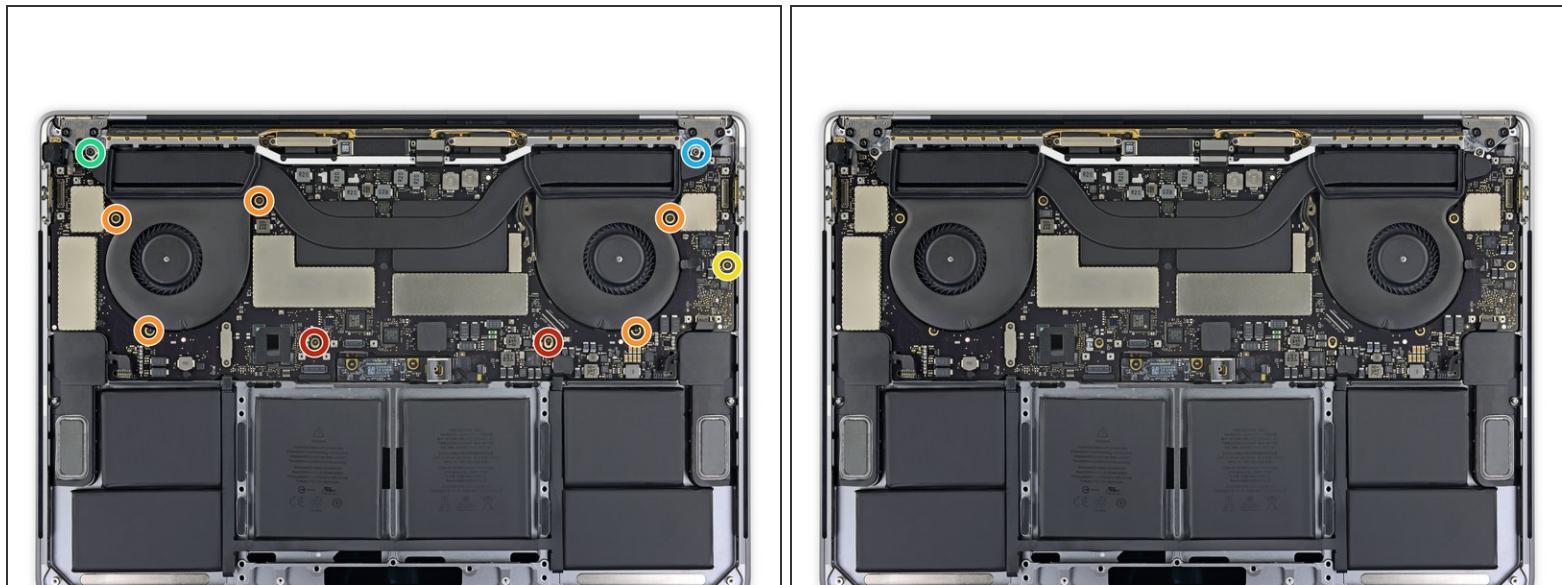
## Step 45



- Disconnect all three antenna cables by prying each one straight up from its socket.
- Slide your tweezers or the flat end of your spudger underneath each cable until it's near the socket, and then gently twist or pry up to disconnect it.

 To reconnect each cable, align the connector directly over its socket, and then press down so it snaps into place.

## Step 46



- Remove the ten screws securing the logic board assembly:

- Two 2.8 mm T3 Torx screws
- Five 2.9 mm T5 Torx screws
- One 3.7 mm T5 Torx screw
- One 3.9 mm T8 Torx screw
- One 3.8 mm T8 Torx screw

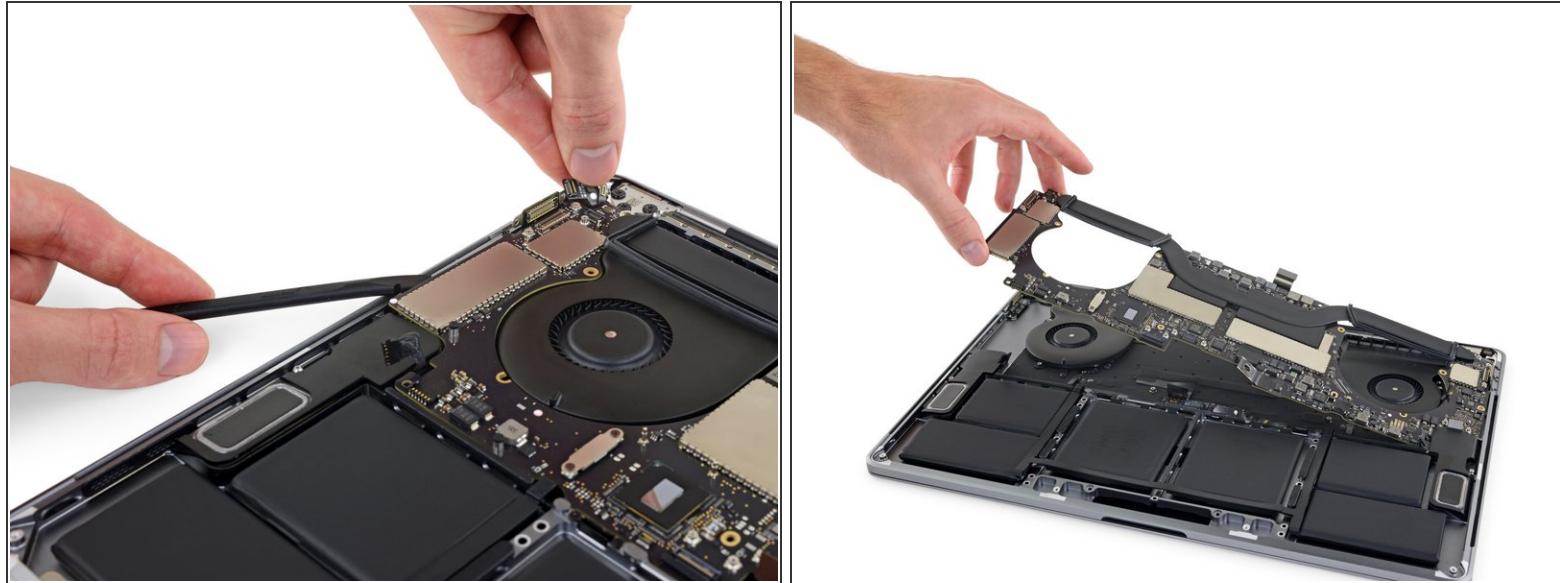
 During reassembly, install these screws only loosely. Adjust the board position if necessary until all the connectors line up, and then tighten the screws.

## Step 47



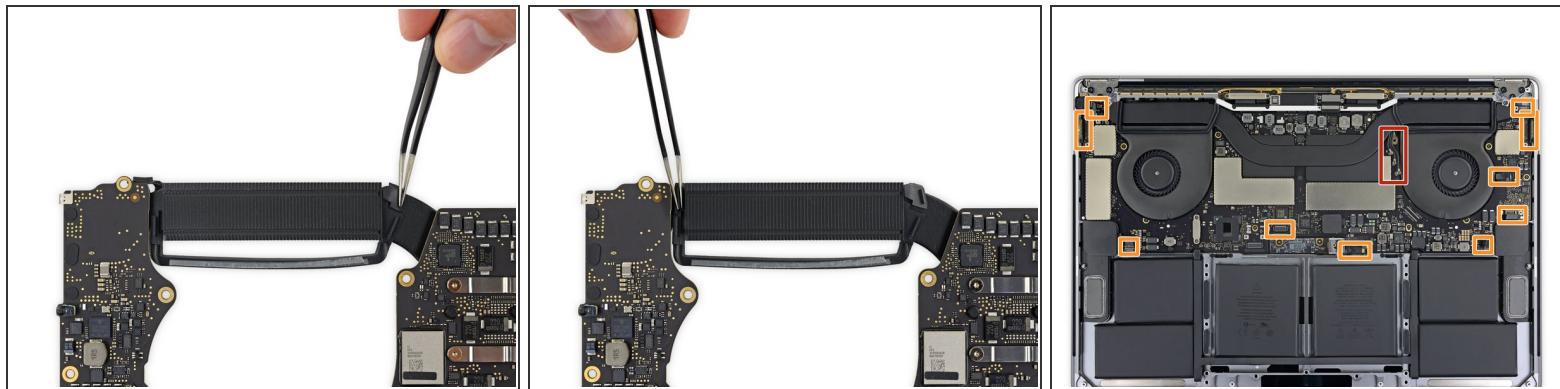
- Peel up (but don't remove) the two rubber vibration damping strips from the adhesive holding them to the fans.
- If needed, apply mild heat with an iOpener, hair dryer, or heat gun to soften the adhesive and make the dampers easier to separate.

## Step 48



- ⓘ The logic board assembly is a tight fit, but you can make it easier to remove by inserting a spudger under the left edge and levering it up slightly.
- ⚠ There should be no resistance as you remove the logic board. Check all cables carefully and hold them out of the way if needed so they don't snag on the board.
- Lifting from the left side, remove the logic board.

## Step 49



 When reinstalling the logic board assembly:

- Check the alignment of the rubber vibration dampers, and adjust them as needed.
- Feed the antenna cable bundle through the gap between the logic board and heat sink, and make sure it lines up correctly as you lower the board into place.
- Verify that no cables get trapped under the board as you install it. Check each marked location carefully.

To reassemble your device, follow these instructions in reverse order.