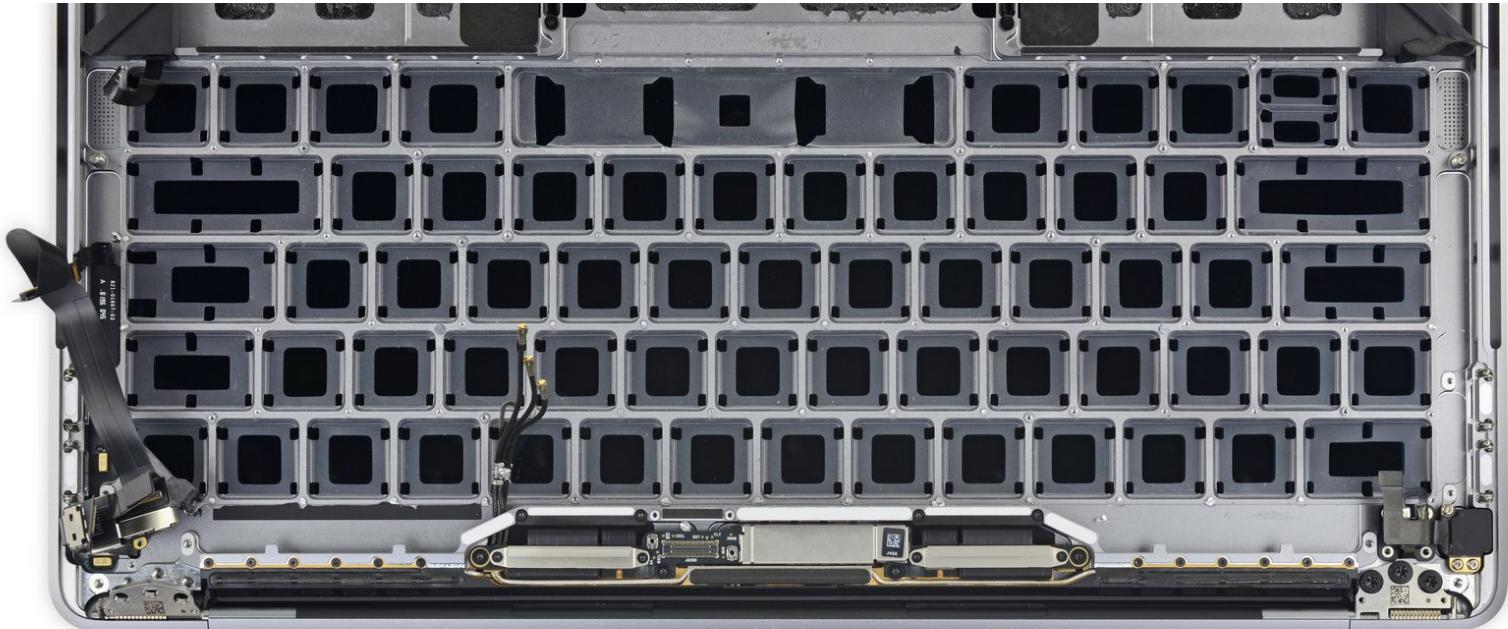




MacBook Pro 13" Touch Bar 2018 Keyboard Teardown

Teardown of the MacBook Pro's 3rd-generation butterfly keyboard, performed July 19, 2018.

Written By: Arthur Shi



INTRODUCTION

As teased in our [MacBook Pro 13" Touch Bar teardown](#), we now bring you an in-depth look at Apple's newly-designed, 3rd-generation MacBook Pro keyboard. For your education and viewing pleasure, we'll push the keyboard to its dust-protection limits, before venturing deep into its many layers. Will the keyboard survive our rigorous tests? Or will it be irreversibly changed? Only one way to find out—time for a teardown!

Looking for more deep disassembly dives? Follow us on [Facebook](#), [Instagram](#), and [Twitter](#) for all the latest teardown news.

TOOLS:

- P2 Pentalobe Screwdriver iPhone (1)
- iOpener (1)
- Tweezers (1)
- Spudger (1)
- iFixit Opening Picks set of 6 (1)
- Curved Razor Blade (1)

Step 1 — MacBook Pro 13" Touch Bar 2018 Keyboard Teardown



- Visually speaking, the new keyboard is *strikingly* similar to the previous model. In the first image you can see the slightly taller option \curvearrowleft symbol on the new model.
- The new keycaps measure ever-so-slightly thinner (about 1.25 mm, vs. 1.50 mm on the 2017 model), allowing for easier removal with less risk of damage. We also note that the [space bar's](#) inner workings have been subtly redesigned.
- And of course, there's the new silicone layer draped over the delicate butterfly mechanisms.

ⓘ A while back, Apple [filed a patent](#) for all sorts of keyboard ingress-proofing methodologies. And today [Apple may have confirmed](#) the silicone's true purpose as dust protection.

Step 2



- Let's address the *key* concern on everyone's minds: do the new silicone implants work? Here's our highly scientific analysis:
 - We sprinkled some blue powder on the keys, mashed on them, and then popped the keycaps off to see where the powder went.
- **Mild success!** The third-gen keyboard (first image) routes *most* of the powder towards the edge of the key and away from the delicate butterfly mechanism. Last year's mechanisms (second image) don't fare so well.
- Accelerated testing (aka more powder, more typing) pushes glowing dust past the membrane's not-infallible defenses and onto the dome switch.

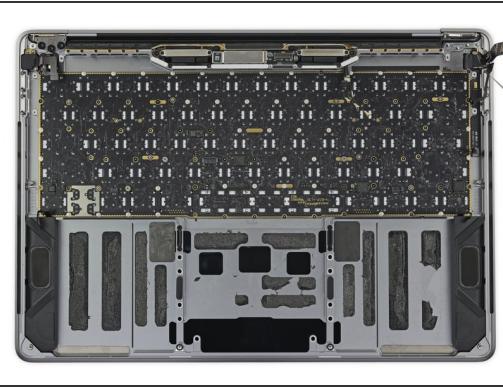
↗ Shoutout to our buddy and fellow Mac enthusiast [@danj](#) for the fluorescent powder idea! Thanks Dan.

Step 3



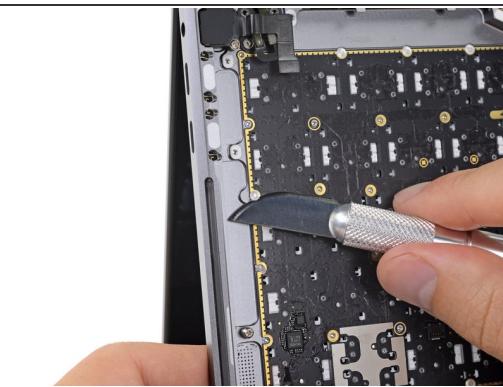
- Stage 1 cleared! Onward to stage 2: the sand test of DOOM.
- We sprinkle a pinch of sand over the keyboard, type on the keys for a minute, and ...
 - We don't even have to lift the keycaps off to realize that something is wrong. A few keys have seized up!
- Prying the keycaps off, we find that grains of sand have invaded through the corner perforations in the membrane and have jammed the butterfly mechanism.
- Conclusion: the silicone membrane adds a significant degree of ingress resistance, but falls short of being fully ~~bulletproof~~ dustproof.

Step 4



- Now that we've extensively explored the topside of the keyboard, it's time to *shift* our attention underneath, where our teardown begins in earnest.
- First we peel back a heavily-glued shield, exposing the large keyboard base.
- Before going any further, we have to return to the top of the keyboard and remove *every* remaining keycap to get access to the silicone barrier.

Step 5



- Just three more stages in this gauntlet before the keyboard can *ESCAPE* its prison:
 - In our line of work, P2 pentalobe screws are as common as, well, iPhones—so we've got the [professional tools](#) to tackle them.
 - Apparently security screws aren't secure enough, so the keyboard also features *rivets*. We had to carve off over a dozen of these single-use posts in order to proceed.
 - What remains is a mild layer of adhesive; we pile on the iOpeners and heat things up.

Step 6



- With all of its defenses thwarted, the keyboard PCB gives way and peels from the chassis, fully exposing the membrane that was sandwiched underneath.
- The membrane happens to be a single sheet of die-cut silicone, reminiscent of some [old-school keyboard covers](#).
- Apart from the improved keycaps, this keyboard design is still pretty lacking in serviceability. The sheer amount of disassembly required, along with obstacles such as rivets and adhesive, makes replacing a failed keyboard seriously impractical.

Step 7



- Wondering where the rest of the 2018 MacBook is? Check out our [13" MacBook teardown](#), or our [15" MacBook](#) video teardown.
- We've also got more detailed keyboard analysis and sparkling commentary for you [over on our blog](#).

 And if you're wondering why we care so much about this keyboard thing, check out our [recap post](#) for the tl;dr.

