MacBook Pro 13" Touch Bar 2018 Keyboard Teardown

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

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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 irrevvversibly changggggd? 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)
Visually speaking, the new keyboard is *strikingly* similar to the previous model. In the first image you can see the slightly taller option ⌘ 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](https://www.apple.com/newsroom/2015/07/apple-files-patent-applications-for-keyboard-ingress-prevention/) for all sorts of keyboard ingress-proofing methodologies. And today [Apple may have confirmed](https://www.apple.com/newsroom/2018/05/apple-reveals-new-keyboards/) the silicone's true purpose as dust protection.
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 @danji 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](https://www.ifixit.com) 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.