Google Pixel 3 XL Teardown

Teardown of the Google Pixel 3 XL, performed on October 16, 2018.

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INTRODUCTION

The Google Pixel 3 XL is all dressed up in the latest flagship phone uniform: glass on the back and a notch on the front. But we're headed past the shiny new facade, for a closer look at the insides. And there's only one way to get there—with a teardown!

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TOOLS:

- Heat Gun (1)
- iSclack (1)
- iFixit Opening Picks set of 6 (1)
- Tweezers (1)
- T3 Torx Screwdriver (1)
- Spudger (1)
- Halberd Spudger (1)
- Suction Handle (1)

Step 1 — Google Pixel 3 XL Teardown

- Let's take a look at the tech that lies under the Pixel 3 XL's newly-notched exterior:
  - 6.3" OLED display with QHD+ 1440 × 2960 resolution (523 ppi) and Gorilla Glass 5
  - Octa-core, 64-bit Qualcomm Snapdragon 845 processor (2.5 GHz + 1.6 GHz) with 4 GB LPDDR4x RAM
  - 12.2 MP, ƒ/1.8, OIS main camera with dual-pixel phase detection autofocus; dual 8.1 MP selfie cameras
  - 64 GB or 128 GB built-in storage
  - Qi wireless charging
  - IP68 water resistance
  - Android 9.0 Pie

Step 2

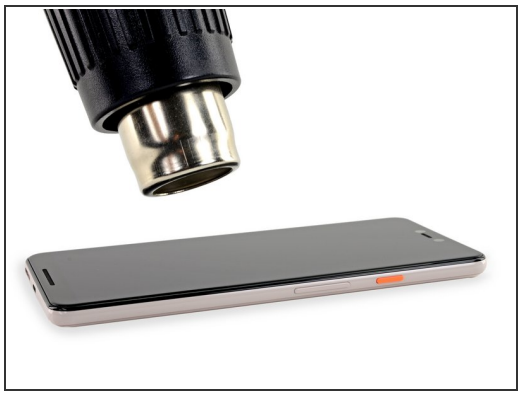
- Before diving inside, lets take a look at the sleek exterior of the Pixel 3 XL alongside its smaller sibling.
- The new backing on these phones looks a lot like the hybrid cover from the last two generations, but this time around it's all a single piece of glass (with a partial matte finish).
  - Unfortunately glass is nowhere near as durable as aluminum, so we're hoping for an easy way to replace what will likely be a commonly-broken part.
- Turning to the front, we spy an extra camera sitting atop both displays.
  - That's right—while everyone else has been throwing more cameras on the back, Google turned around and added an ultrawide (19 mm equivalent) camera next to the existing wide angle (28 mm equivalent) camera.
- Exclusive to the Pixel 3 XL is a trendy little ~~robot~~ notch that greets us as we turn on the phone.

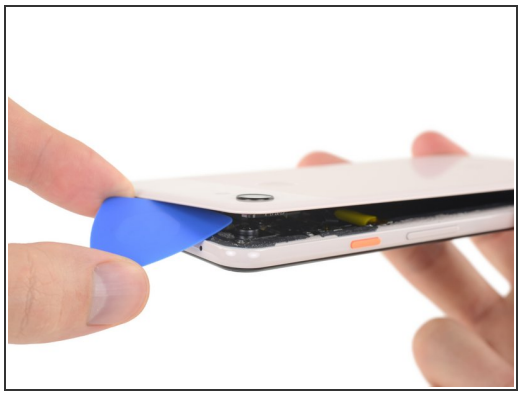
Step 3



- The front-firing speakers on both Pixel 3's leave the aluminum frame devoid of any speaker grilles.
- Stacked together, it's obvious that one of these phones is a little more XL than the other, but there's not much difference otherwise.
- USB-C charging port, SIM card slot, and 80's themed power buttons are present and accounted for on both phones.

Step 4





- Now that we've worked our way around the exterior, it's time to head inside.
- Experience tells us that a little suction and cutting is all that's required to coax the display open, but when that doesn't work we bring out the big (heat) guns.
  - It looks like the Pixel 3 XL still uses foam adhesive, but it's far more tenacious than the repair-friendly stuff we saw last year.
- We pull out the trusty iSclack, expecting to separate the display assembly, but the rear cover yields first!

ⓘ This whole thing is starting to remind us less of the Pixel 3's predecessor, and more of its notoriously sticky contemporary.

Step 5

- After struggling through quite a bit more adhesive than expected, we're in!
  - Maybe Google thought the extra glue was necessary for that extra liquid IP point, but we've seen other IP68 phones that are easier to open.
- Thankfully, the fingerprint sensor cable is long enough to avoid being torn by over-zealous openers.
- The view inside is pretty much what we expected: a shiny new wireless charging pad, a battery, a board, a couple cameras, and a fingerprint sensor living on the rear cover.
- Slightly less expected are metal covers over the motherboard, and a SIM tray hidden somewhere underneath the speaker assembly.
- Google thought they'd scare us off with a few screws? Well guess what: we came prepared with a Torx bit for these screws, and 111 other bits just in case.

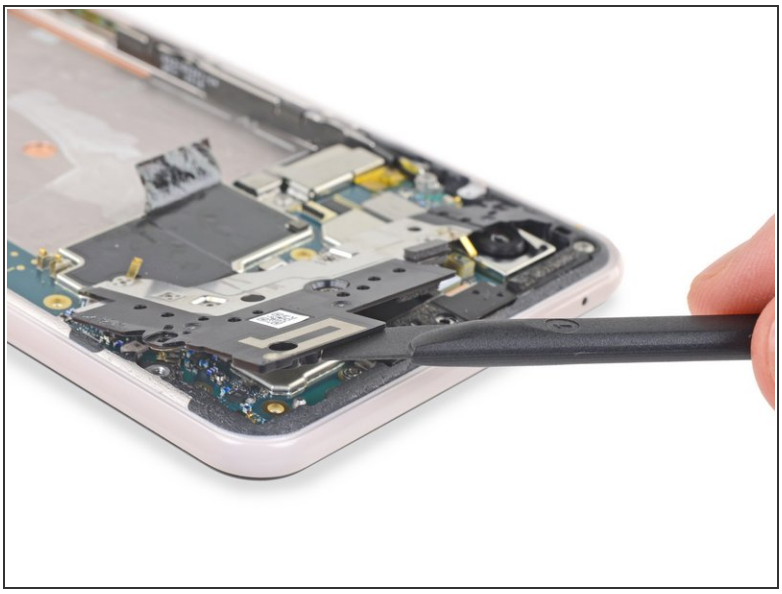
Step 6

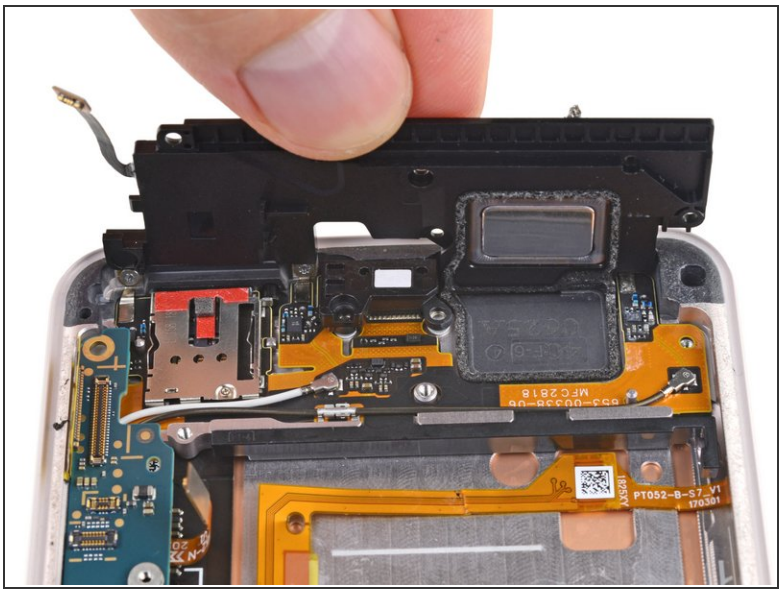


- The tough adhesive trend continues, holding the wireless charging coil to the Pixel's powerhouse. But we spy some respite!
- The battery is secured with relatively repair-friendly stretch-release adhesive. So you get at least one chance at easy removal, if your technique is right!

  These strips didn't actually help *us* much, but the Pixel 3 had better luck.
- We resort to flossing out the battery and accidentally cut a fragile ribbon cable hiding underneath! Forewarned is forearmed—a repair manual would have helped us in this arena.
- Adhesive ordeals aside, the battery's out: the Pixel 3 XL is packing 13.2 Wh. That's actually down a smidge from the Pixel 2 XL's 13.6 Wh, and around the same as the original Pixel XL's 13.28 Wh.
  - The Pixel 3 XL still beats out the iPhone XS Max (12.08 Wh), and comes close to the Galaxy S9+ (13.48 Wh).

Step 7

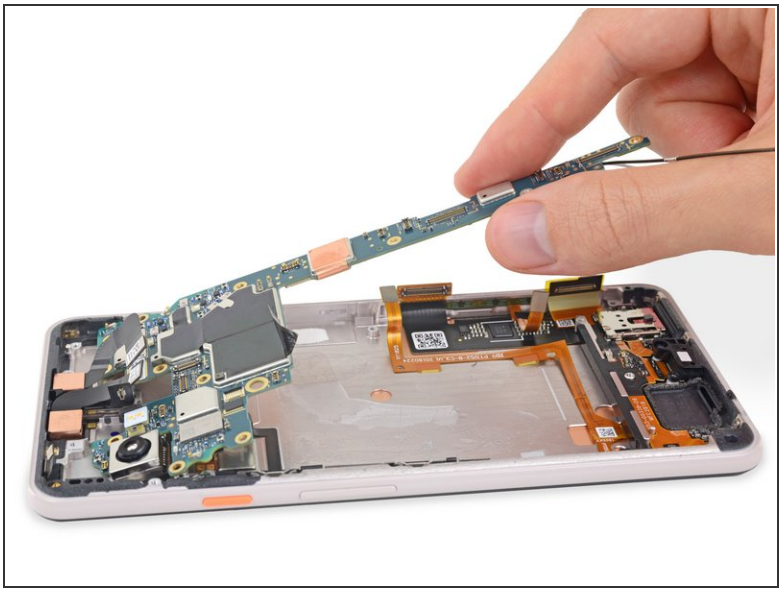


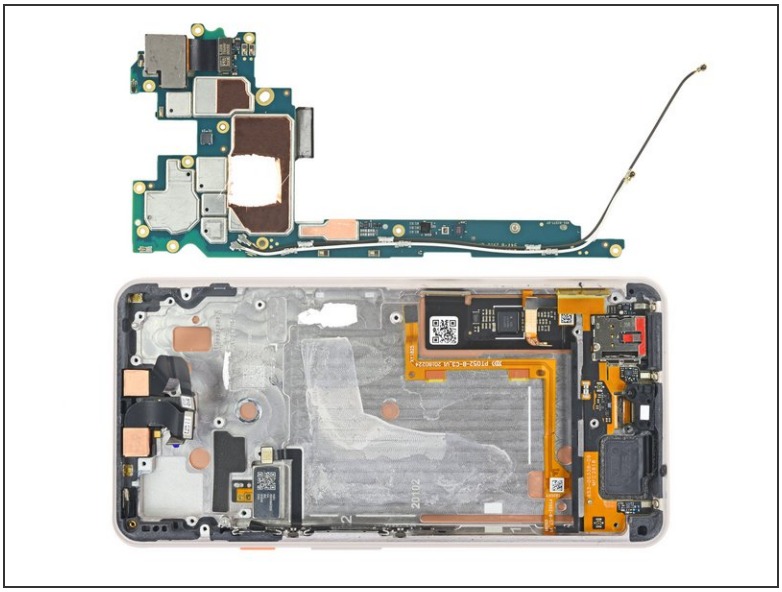


- Above the crater where the battery once lay, we extract an antenna shielding the motherboard.
- On the south end of the phone, we battle some more adhesive to release what seems like just another shield.
  - Another trap! This shield is actually the speaker housing, which we just split in half trying to access the components underneath.

ⓘ The speaker chamber is sealed with waterproofing adhesive, and that seal has to be broken to access any of the commonly-serviced ports on the daughterboard.

Step 8

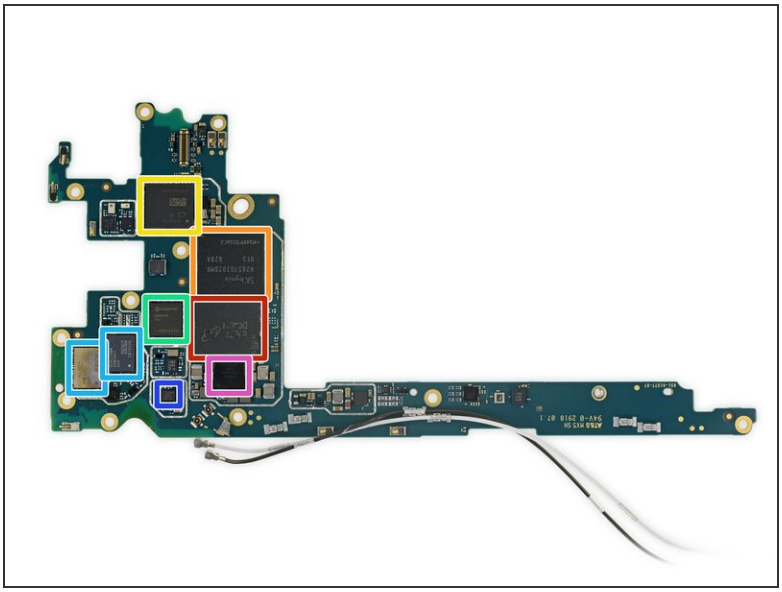


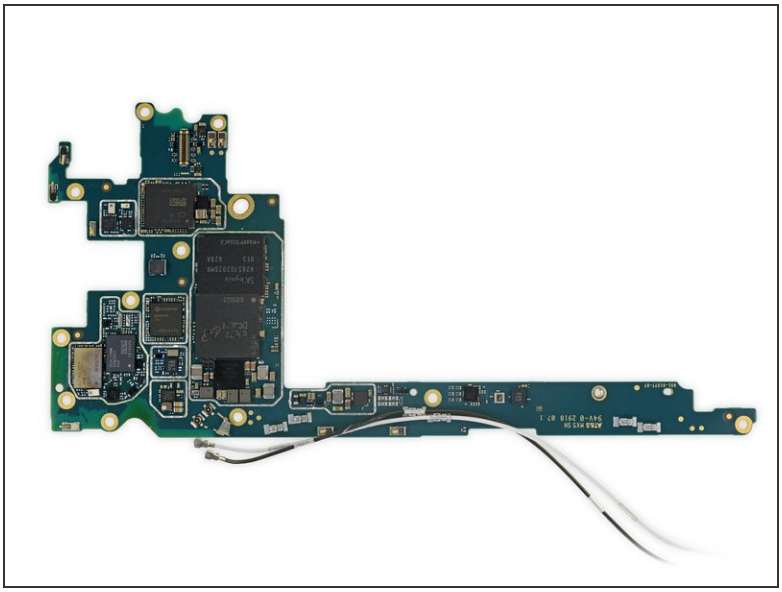


- With its shields down, we can finally get a look at the newest Pixel's motherboard.
- As the board comes out, we can't help but notice generous helpings of thermal paste on its underside, to transfer heat from the hardest working chips to the metal frame.

ⓘ It seems like a lot of paste, but powerful hardware produces a lot of heat.

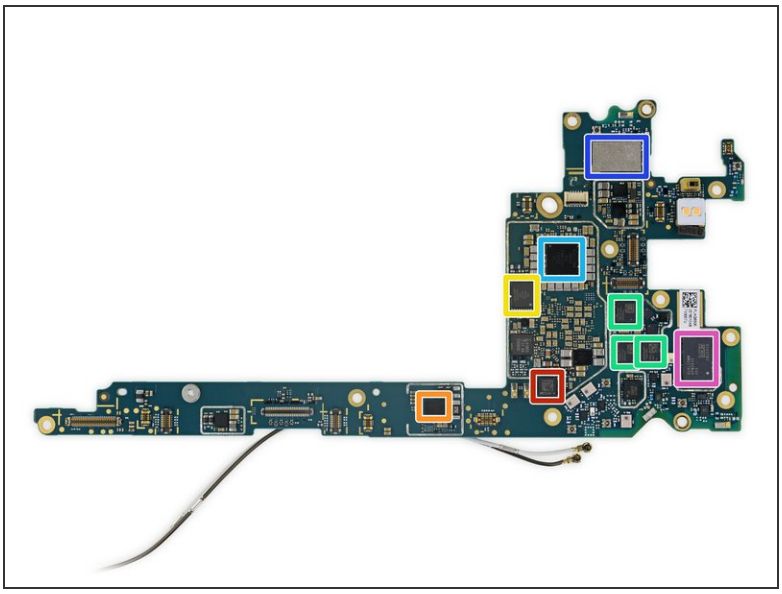
Step 9

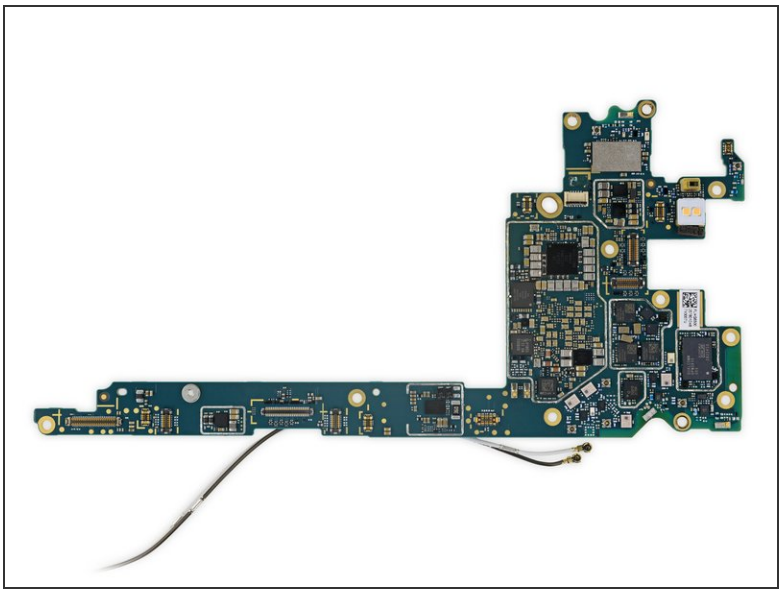




- All this glue has us tired—let's sit down for some chips:
  - Micron 8JE77G9WGH 4 GB LPDDR4X DRAM layered over Qualcomm Snapdragon 845
  - Skhynix H28S7Q302BMR 64 GB Universal flash storage
  - Google SR3HX Pixel Visual Core (as seen in the Pixel 2 XL)
  - Qualcomm SDR845 RF Transceiver
  - Qualcomm QPM2622 and QPM2642
  - Qualcomm QET4100 40MHz envelope tracker
  - Qualcomm PMI8998 PMIC

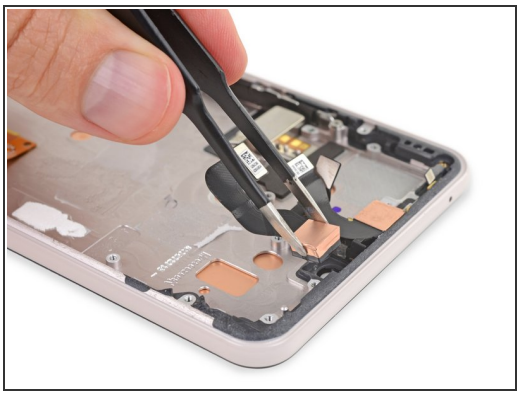
Step 10

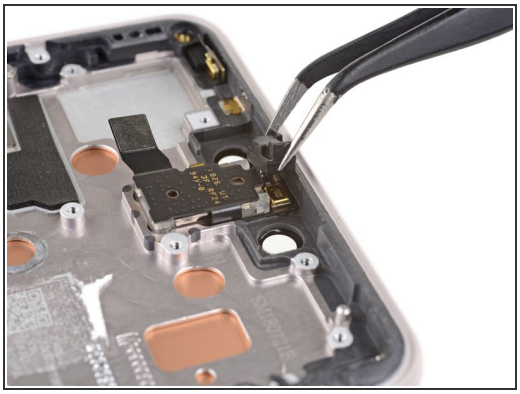


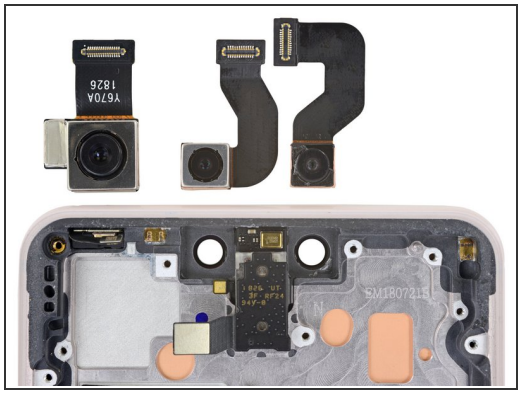


- Maybe just a couple more...
  - Google H1C2M Titan M security chip
  - IDT P9221 Qi wireless charging receiver
  - Qualcomm WCD9340 Aqstic audio codec
  - Qualcomm QDM3620, QDM3670, QDM3671 Diversity Receive Modules
  - Qualcomm PM845 power management IC
  - Murata 1QB SS8601001
  - Qualcomm QPM2635

Step 11

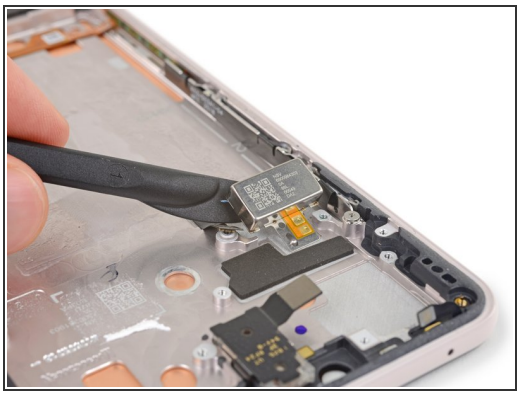
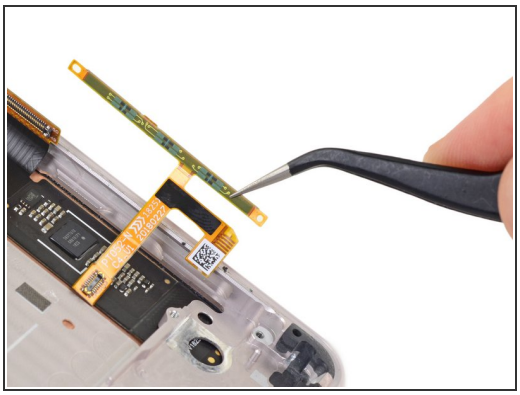






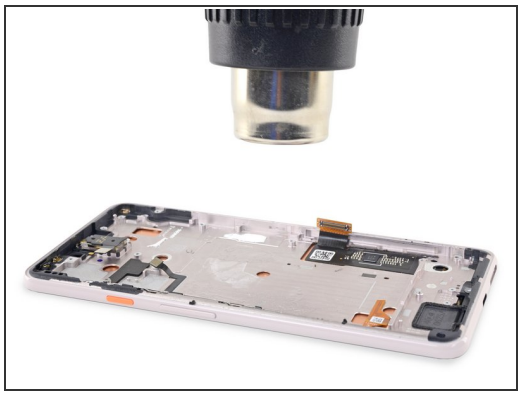
- We carefully extract the ~~left eyeball~~ wide angle camera, which is lightly adhered to the frame.
  - According to Google, this extra camera will let you fit more of your friends into your selfies, which makes them ... Group-ies?
- On the back, Google is again betting that AI can help a single sensor to do the work of two.
  - Based on early reviews, they may be right. Word on the street is, this is a slightly upgraded Sony IMX363 sensor—the rest is up to the Pixel Visual Core.

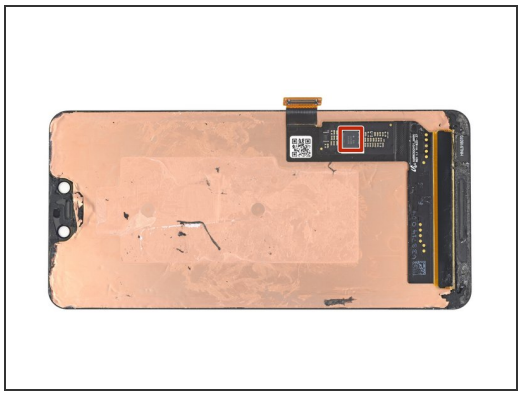
Step 12

- The daughterboard comes out without any fuss, taking the USB-C port, SIM tray, and some antenna hardware along with it.
- The vibration motor is a little more reluctant to leave its home, but our Halberd Spudger can be very persuasive.
  - This vibration motor is said to be improved from last year, capable of providing more precise haptic feedback.
- The strain gauges come out looking just as huggable as ever.

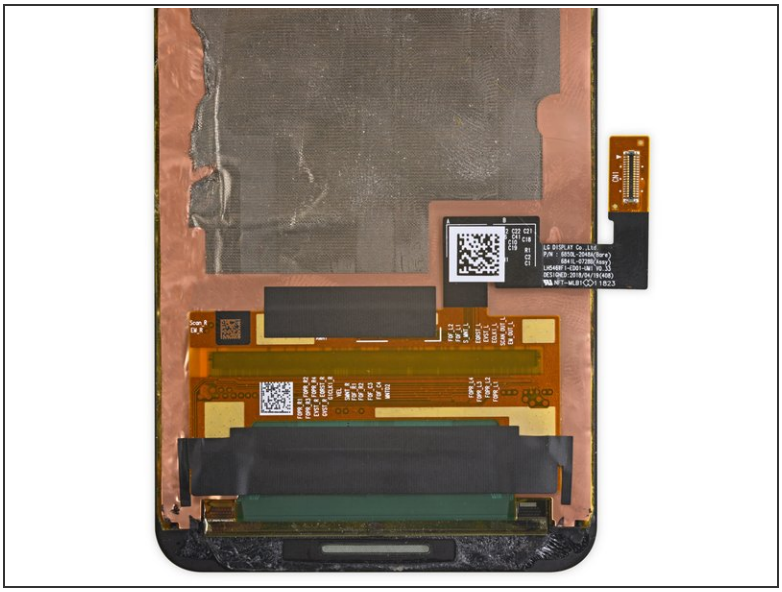
Step 13

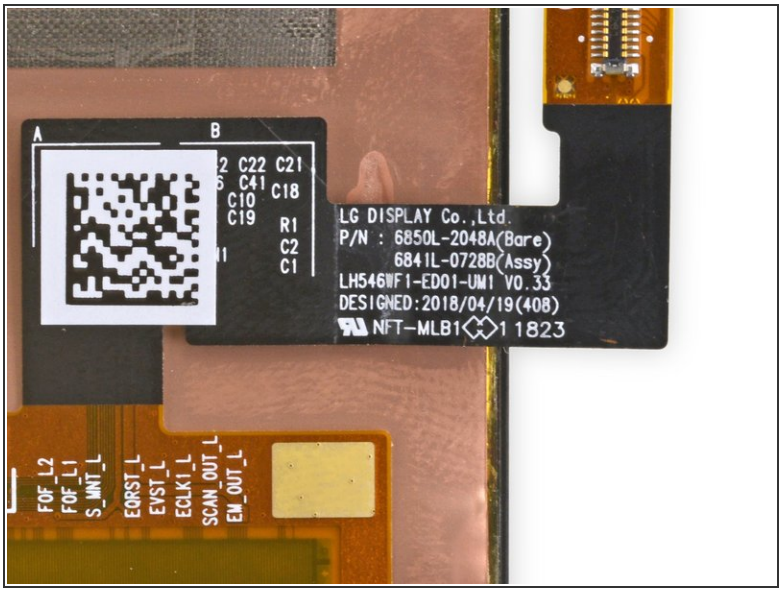




- In the name of science, we opt to dismantle our display to learn from whence it came. Its defenses are strong, but no match for heat, patience, and a can-do attitude.
  - At first, the frame's black border tricks us into thinking the display curves down to the frame. Future pryers, beware!
- Drumroll please.... it's a Samsung! Rumors were all over the place, but it looks like Google is going with Samsung's trusty AMOLED panels this year.
- Samsung's panels should be a little more reliable than last year's, but unfortunately this one comes with a Samsung-esque repair process as well.
  - Replacing a Pixel 3 screen will be tricky, and will most likely require replacing the whole frame of the phone.
- Last, but not least, a display chip sitting alone on the display cable:
  - Samsung S6SY761X touch controller (as seen on the S9+)

Step 14





- **Teardown Update**: since you asked, we dissected the display in the smaller Pixel 3 as well. Guess what? This one's from **LG Display**!

So it's a full reversal from the situation last year, where the Pixel 2 got a Samsung panel and its bigger sibling had a display from LG.

- Rumor has it LG has been working hard to improve its OLED mobile technology—we're curious to see how their new display fares this year.

Step 15

- Here are all the pretty parts that are packed into this ~~Galaxy~~ Pixel!
- Hungry for more teardown treats? The video team is here to please with the Pixel 3 video teardown!
- It seems like the Pixel has been hanging out with the troublemaking Galaxy line, leaving it with familiar-looking antenna assemblies, a stubborn battery, and a tough-to-replace display—manufactured by Samsung itself!
- Not only will swapping a cracked screen require a complete phone disassembly, but you've gotta think about the back now, too. The Pixel 2 XL rear glass covered 20% of the phone— the Pixel 3 XL's rear panel is 100% crackable. That doesn't bode well for repairability...

Step 16 — Final Thoughts

- The Google Pixel 3 XL earns a **4 out of 10** on our repairability scale (10 is the easiest to repair):
  - The only screws are standard T3 Torx fasteners.
  - Repair-friendly stretch-release adhesive secures the battery.
  - O-rings and adhesives for waterproofing complicate repairs, but make difficult liquid damage repairs less likely.
  - Display repairs are much more difficult than previous models, requiring complete disassembly of the phone.
  - To service any component, you'll have to painstakingly un-glue (and later re-glue) the glass rear panel.
  - Front and back glass means increased vulnerability to drop damage.