



Google Pixel XL Teardown

Teardown of the Google Pixel XL, performed October 20, 2016

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INTRODUCTION

Today marks our first ever teardown of a phone designed entirely by Google: the **Pixel XL**. What to expect? At first glance, it bears more than a passing resemblance to an [iPhone](#)—but it's the innards in which we're interested. Grab ahold of your Nougat, because it's time to tear this smartphone asunder.

Follow along on [Facebook](#), [Instagram](#), or [Twitter](#) for the latest news from the repair world.

[video: <https://www.youtube.com/watch?v=8aHkZu339mU>]

TOOLS:

- [T5 Torx Screwdriver](#) (1)
 - [iFixit Opening Picks set of 6](#) (1)
 - [Spudger](#) (1)
 - [Suction Handle](#) (1)
 - [iOpener](#) (1)
 - [Tweezers](#) (1)
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Step 1 — Google Pixel XL Teardown



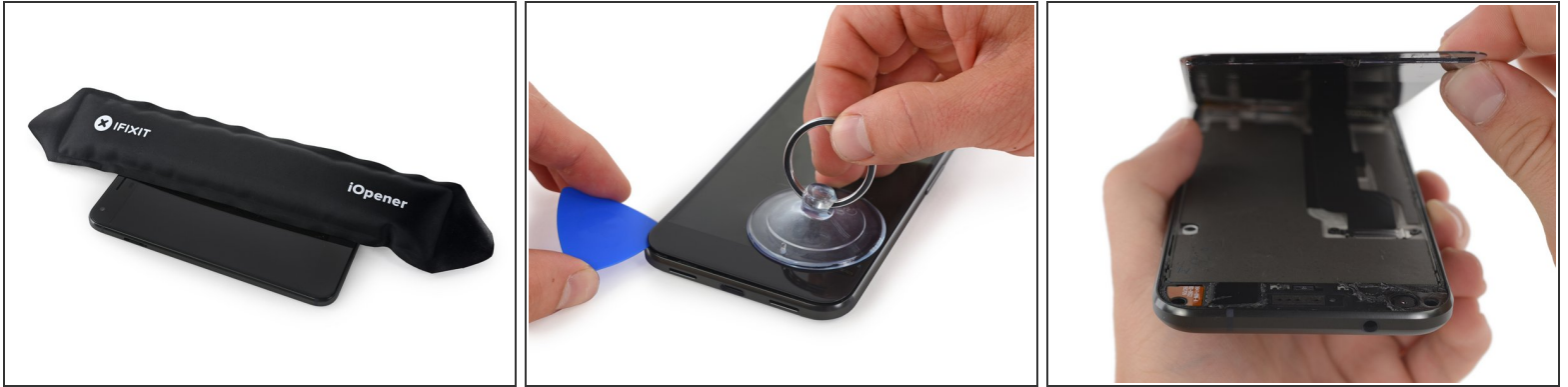
- Early reviews of the Pixel phones have been positive—and looking at these specs, we're not surprised:
 - 5.5" AMOLED display with QHD 1440 x 2560 resolution (534 ppi) and 2.5D Gorilla Glass 4
 - Quad-core, 64-bit Qualcomm Snapdragon 821 processor (2.15 GHz + 1.6 GHz) with 4GB LPDDR4 RAM
 - 12.3-megapixel, f/2.0 main camera with phase detection autofocus and laser detection autofocus; 8 MP selfie camera
 - 32 GB or 128 GB built-in storage
 - Pixel Imprint back-mounted fingerprint sensor
 - USB Type-C port and 3.5 mm headphone port
 - Android 7.1 Nougat

Step 2



- Despite its claim to be Google inside and out, this Pixel may have had some fruity inspiration.
 - Similar styling aside, there are a few physical features that set the Pixel XL apart from its most rosey competitor:
 - No home button—Google opted for [on-screen buttons](#), allowing for a sleek, button-less front face.
 - A back-mounted fingerprint scanner, and a single rear-facing camera (sans unsightly bump).
 - Two speaker slits—rather than holey grilles—and a USB-C port, not a proprietary Lightning port.
- ✦ Oh yeah! It also kept its [headphone jack right at the top of the phone](#).

Step 3



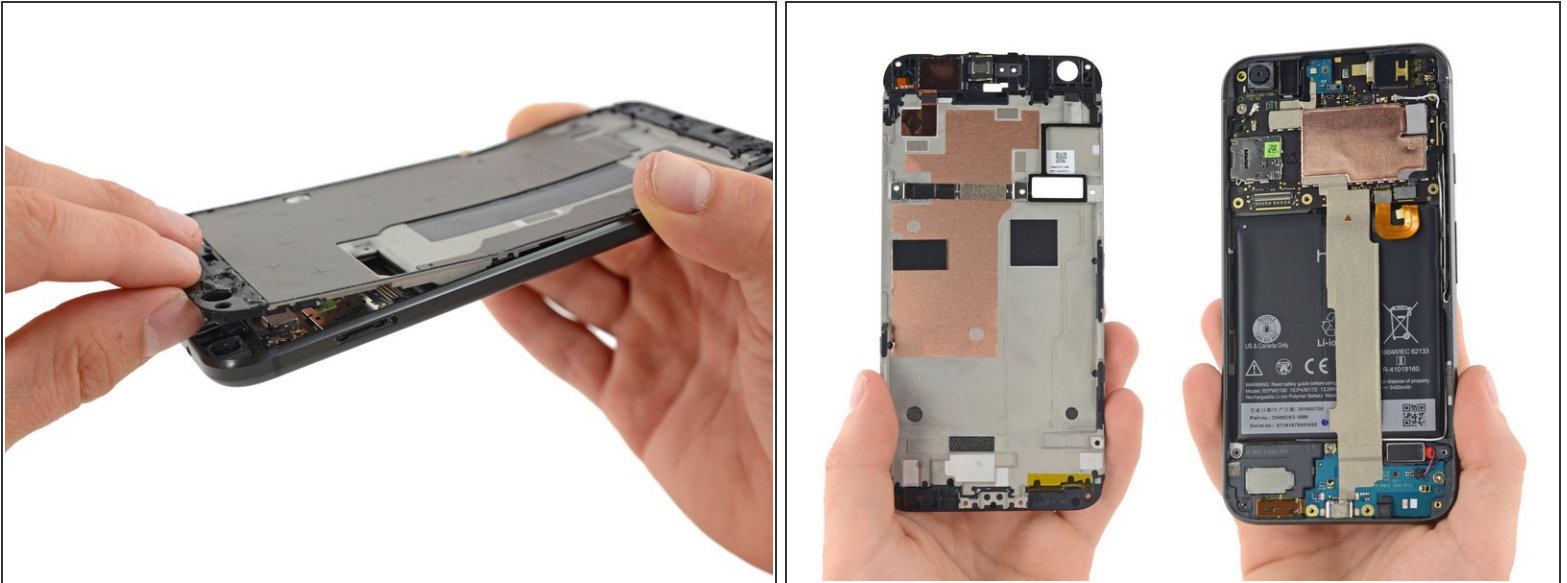
- Given the familiarity of this iPhone look-alike, our confidence nears cockiness as we take a play from our [iPhone 7 Plus guides](#), heat an iOpener and select our lucky opening pick.
- After a minute of heat and a minute of prying, we lift open the phone from the top, expecting to expose its inner workings to the world.
- But alas, a screwed-down bracket on the display cable halts our progress. Time to dust off our driver and dive a little deeper.

Step 4



- Our path to victory is clear: remove the bracket, free the display, win. Tools from the [64 Bit Driver Kit](#) make short work of the T5 Torx screws.
- ☑ We like to say that we break things so you don't have to. That's what happened here today. Teardowns are our opportunity to learn how a new device goes together—so we can develop guides with a repeatable, nondestructive procedure for everyone else to use.
- In this case, the OLED panel separated from the digitizer glass a little too easily for our liking. Super-thin components and no frame or bezel behind the display make it extra sketchy to remove—but, we'll be working on a better way to get it out next time.
- ⓘ The Samsung-manufactured display bears the part number AMS546KD09.
 - And riding on the back of the display panel: a Synaptics ClearPad [S3708](#) touch controller.

Step 5



- This slim and rigid midframe is likely made of [magnesium](#), and is clipped (really firmly) onto the body of the phone.
 - ⓘ When we say "rigid" we expect it to not be "bendy". We expected wrong. Oops. It'll bend back.
- On the left, the midframe holds a mysterious ribbon connector and an earpiece speaker.
- And to the right, the rest of the phone, complete with motherboard sporting a matte black finish.
 - ⓘ The daughterboard is a standard blue-green; no family resemblance there.

Step 6



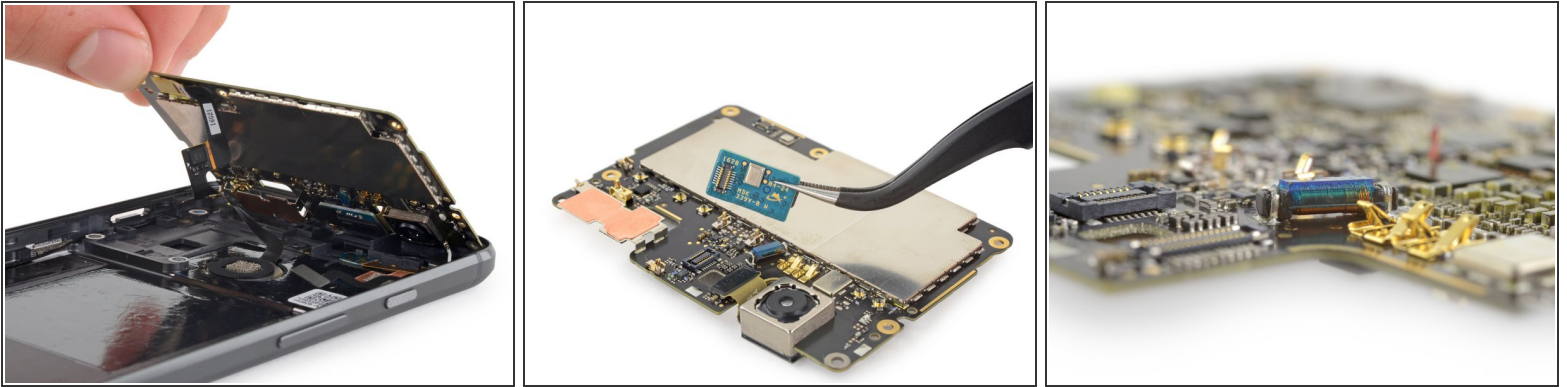
- Google has a different take on the ["pull to remove" battery tab](#): a perforated portion of the sleeve that, when peeled away, becomes an impressive pull tab.
- Two strips of fairly strong adhesive secure this HTC-made battery, but the pull tab does its job without heat. (And may do double duty as a tamper-evident seal?)
- This 13.28 Wh battery beats out the 11.1 Wh [iPhone 7 Plus](#), but not the [Galaxy S7 Edge](#) with its 13.86 Wh powerhouse.
- ❗ Worth *note*-ing, the [exploding](#) Samsung Galaxy [Note7](#) packed a 13.48 Wh battery before its untimely demise.

Step 7



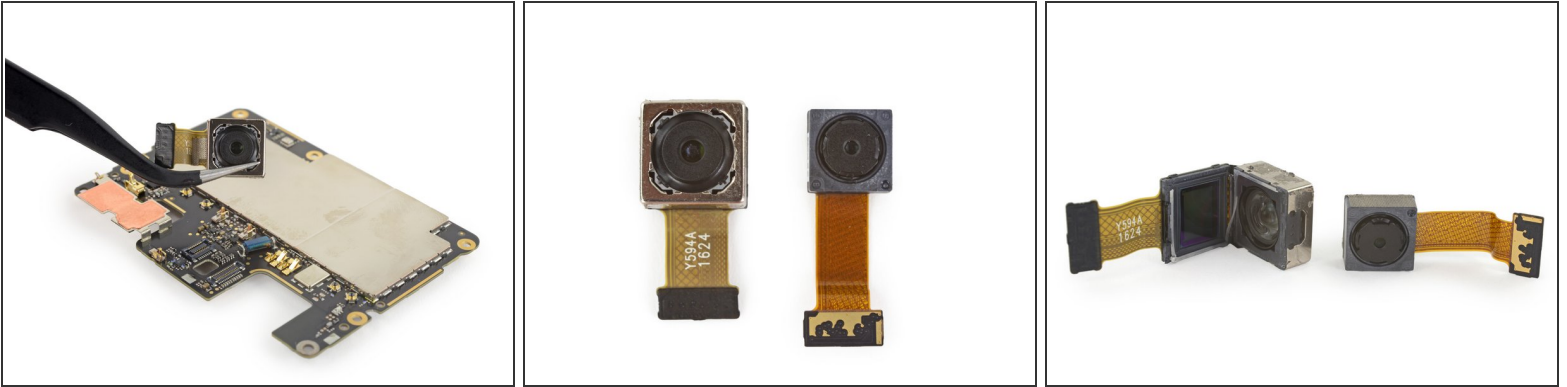
- Time to pick a peck of Pixel parts!
 - ❗ We love modularity! All of these small components can be replaced independently, and will be inexpensive replacement parts.
- Out first is a [strange one](#): a combination laser autofocus and microphone board.
- Next out: the 3.5 mm headphone jack. (Take that, Lightning headphones.)
- And finally, the 8-megapixel front-facing (selfie) camera.

Step 8



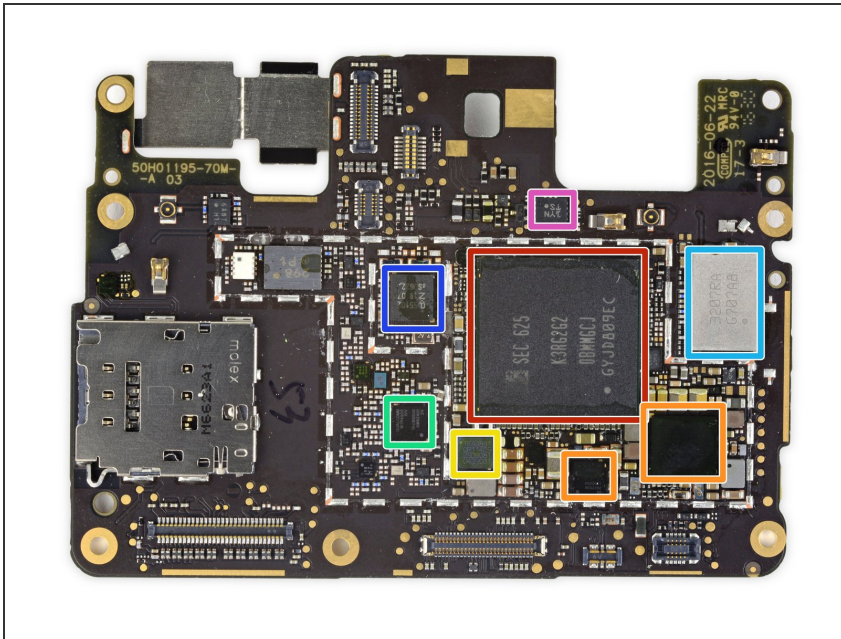
- We really just want to look at this motherboard, but we're thwarted by a ([very Apple-like](#)) fingerprint sensor cable boobie trap! Fortunately, it proves very easy to disarm.
 - Next is another mini board with microphone and the rangefinder that enables the XL's laser autofocus.
 - ⓘ These smaller bits aren't always so modular; in other phones, we often find them clustered together on the main board. More modularity means cheaper and easier repairs—if a single component fails, you don't have to replace the entire motherboard or embark on a risky microsoldering adventure.
- 🔧 **Teardown Update:** This blue "mystery" component hanging out next to the main camera is likely a passive inductor, as evidenced by its two solder pads and copper wire coil.

Step 9



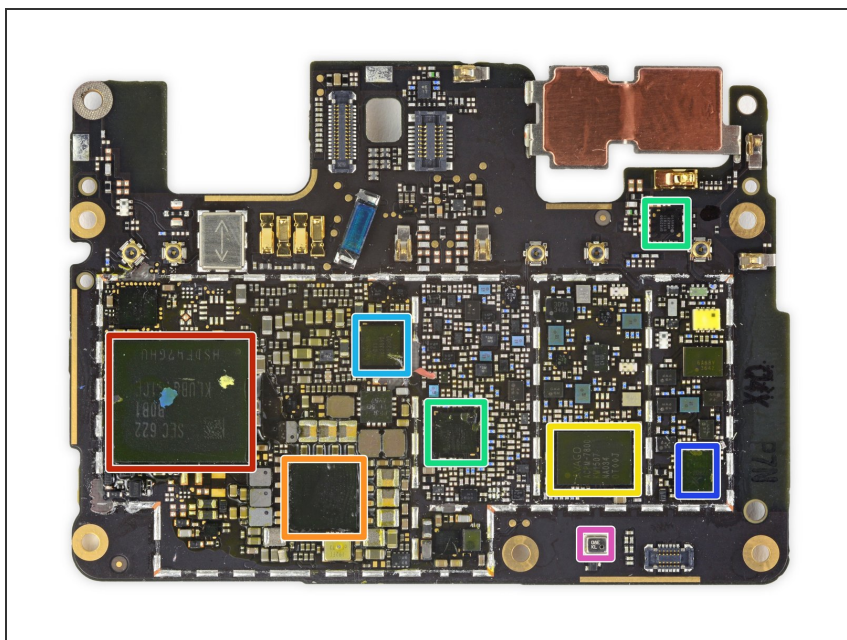
- Finally, we remove the highly touted rear-facing camera! At 12.3 megapixels, it's no slouch—though it lacks the fancy optical image stabilization mechanism we found on both of this season's iPhones.
 - And here are the rear- and front-facing cameras side by side, for a little size comparison.
 - And a peep at the sensor and optics in the main camera!
- ★ [And a bonus peep at the primary camera](#) using X-ray vision (hat tip to our buddies at [Creative Electron](#))!

Step 10



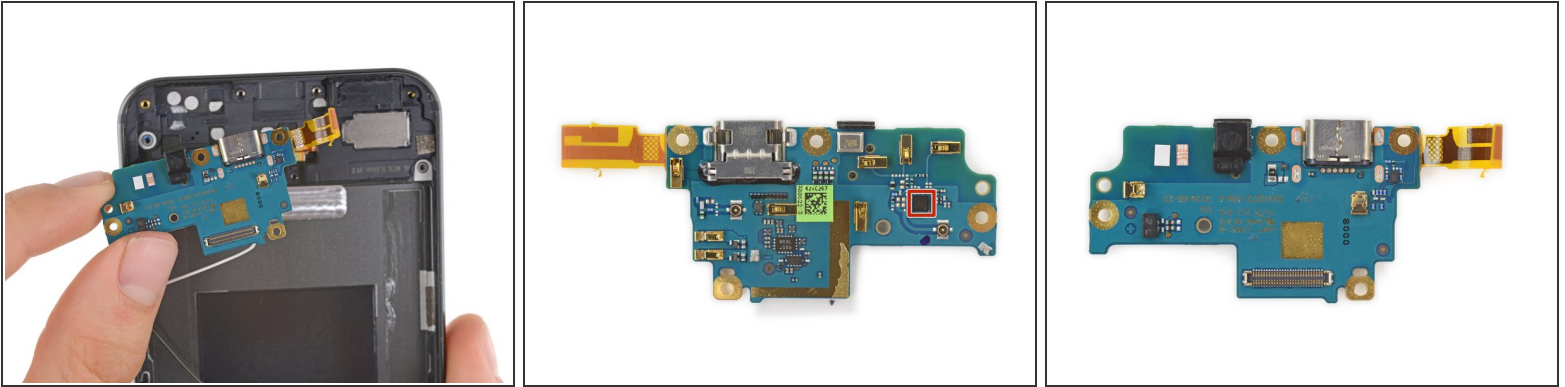
- Chips on the front of the motherboard:
 - Samsung [K3RG2G20BM-MGCJ](#) 4 GB LPDDR4 mobile DRAM with a quad-core Qualcomm Snapdragon 821 processor layered underneath (two cores clocked at 2.15 GHz and two cores clocked at 1.6 Ghz)
 - Qualcomm PMI8996 power management IC, and Qualcomm [SMB1350](#) Quick Charge 3.0 IC
 - NXP [TFA9891](#) smart audio amplifier
 - Qualcomm [WTR4905](#) LTE RF transceiver
 - 3207RA G707A (looks like Wi-Fi)
 - NXP 55102 1807 S0622 (likely NFC controller)
 - Bosch Sensortec [BMI160](#) low power IMU

Step 11



- And on the back:
 - Samsung [KLUBG4G1CE](#) 32 GB Universal Flash Storage (UFS) 2.0
 - Qualcomm PM8996
 - Avago [ACPM-7800](#) power amplifier
 - Qualcomm [WTR3925](#) LTE RF transceiver, and Qualcomm [RF360](#) Dynamic Antenna Matching Tuner (QFE2550)
 - Qualcomm WCD9335 audio codec
 - Skyworks [SKY77807](#) Quad-Band Power Amplifier Module (PAM)
 - Bosch Sensortec [BMP280](#)-series barometric pressure sensor

Step 12



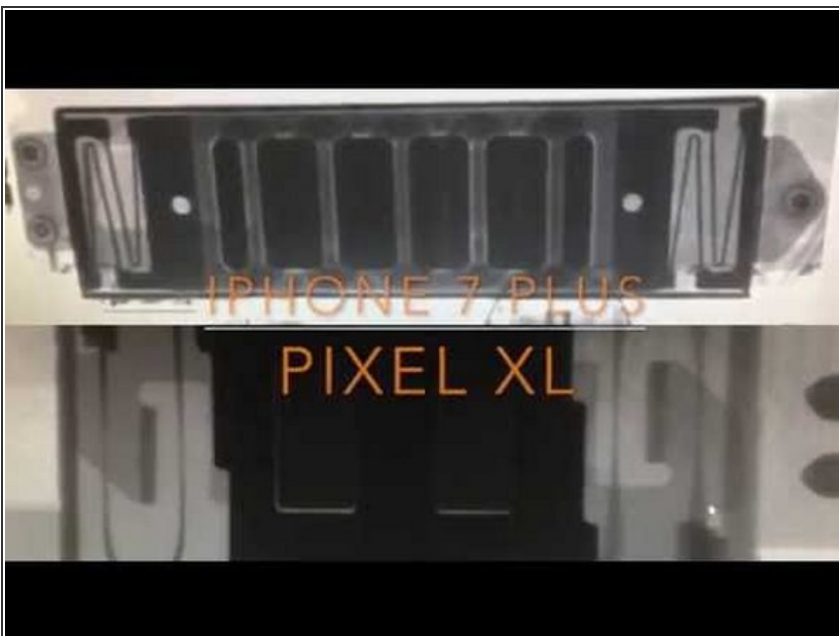
- The daughterboard pops out of the rear case with relative ease, giving us access to the USB Type-C port and the microphone.
- This is a pretty bare-bones part, which means cheap USB port replacements. Historically, USB ports have been a common failure point (although USB Type-C may prove somewhat more robust in that regard).
- ☑ Unfortunately, USB-C has been having, erm, [other issues](#).
- We found one bit of silicon on the daughterboard: a Qualcomm [QFE2550](#) dynamic antenna matching tuner.

Step 13



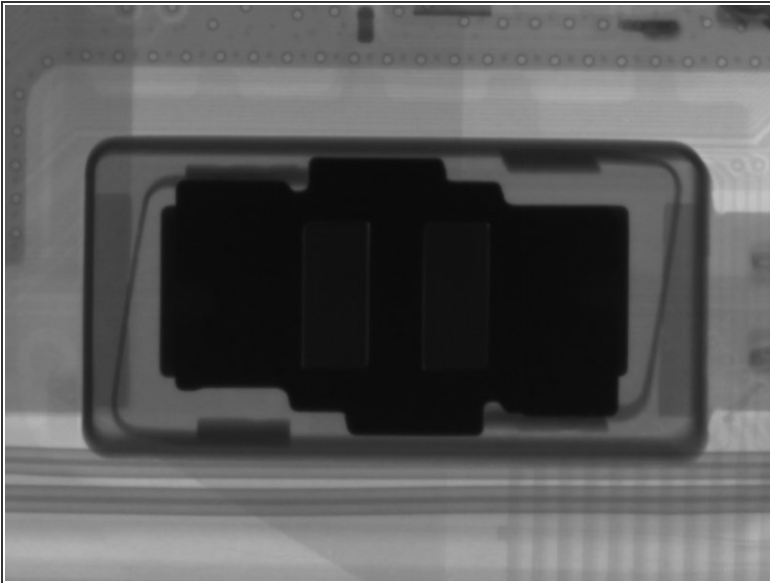
- We give the Pixel Imprint fingerprint sensor a poke, popping it like a hatch from the rear case.
- Up close it looks [different from](#), but [reminiscent of](#) those found in Google phones past.
- ❗ With nearly everything out of the case, we've seen almost zero evidence of this phone's HTC manufacturing origin.
 - Despite being a major smartphone brand in its own right, this time HTC appears to have left its mark on nothing save the battery. As Google's [silent partner](#), it has been relegated to the same status as Foxconn.

Step 14



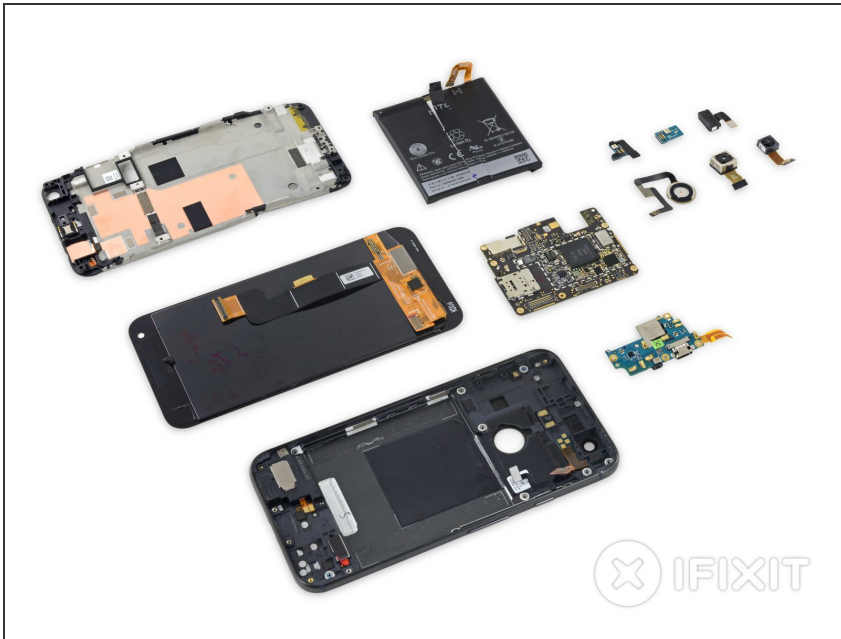
- Still affixed to the Pixel XL's chassis is the oscillating linear vibration motor—and that's right where we want it, because a little X-ray magic shows it in action.
- Our esteemed co-conspirators at [Creative Electron](#) rigged up this sweet video comparing the Pixel-powered motor with the latest Taptic Engine from the iPhone 7 Plus. Check it out!

Step 15



- **Teardown Update:** You asked and we answered—here's a closer (and less shakey) shot of that vibrating motor.
- We weren't too impressed with the vibrators plain-shiny-metal-box exterior, so we took a rotary tool to the casing in the name of science.
- ⓘ Disclaimer: We were armed with X-Ray images to guide our journey and stumbled upon *exactly* what we expected: a itty weight between bitty springs.
- ✦ *Linear oscillator* is the technical term for a weighted magnetic core shaking between two springy metals. The rate and travel of that vibration simulate tactile feedback, which translates into a virtual *click* without any external moving parts.

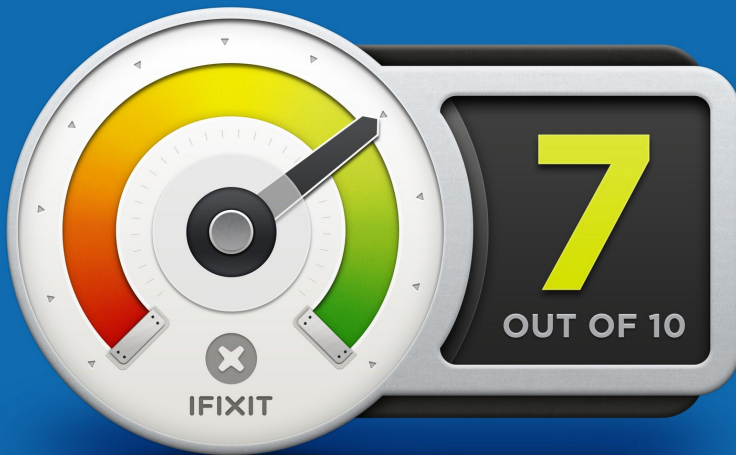
Step 16



- Here's a pixel-packed picture of some primo Pixel parts, just for you!

Step 17 — Final Thoughts

REPAIRABILITY SCORE:



- The Pixel XL earns a **7 out of 10** on our repairability scale (10 is the easiest to repair):
 - Many components are modular and can easily be replaced once the display assembly is removed.
 - The battery has a removal tab and is adhered by a modest amount of adhesive, making its removal painless.
 - All of the screws are T5 Torx screws.
- The opening procedure requires prying up a thin, poorly-supported display assembly making it difficult to open the phone without damage.
- In addition to screws, the midframe is secured by snug, press-fit notches that make its removal (and subsequent repairs) laborious.