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Apple Shouldn't Get to Brick Your iPhone Because You Fixed It Yourself

Author: Kyle WiensKyle Wiens

9-11 minutes

- Update at 2:19 p.m. ET on 2/18/2016: Just hours ago, Apple apologized and admitted that Error 53 was indeed a mistake and not a deliberate security feature. "This was designed to be a factory test and was not intended to affect customers," Apple said to TechCrunch. They also released an updated version of iOS 9.2.1 that fixes Error 53, effectively "unbricking" phones disabled by the problem and preventing it from happening in phones repaired outside of Apple's network. iFixit techs are verifying the fix in our lab and will update when we have results.*

  This is a victory for consumers and a clear concession that

independent repair is an important part of the ecosystem.

Until recently, not many people knew about Error 53, the strange, seemingly-inexplicable glitch that quietly turns working iPhones into iPaperweights. Scattered across the Internet, reports had emerged for months of people whose phones were permanently disabled after an iOS update. Then, quite suddenly, the error hit the fan. In response to an investigation that I assisted *The Guardian* with, Apple confirmed that Error 53 was real, and it targeted phones that had been repaired by anyone other than Apple.

Specifically, Error 53 is triggered by repairs—made by the owner or an independent repair shop—that affect the home button and its flex cable. Why the big fuss over such a little button?

An iPhone's home button—with its embedded fingerprint sensor—is paired to a phone at the factory. Thanks to entropy, sometimes home buttons break; sometimes they get replaced when users swap out a shattered screen. When you replace an original home button with a different one, iOS detects the hardware change. And it shuts down Touch ID completely (which is a good security feature). Only Apple has the tech to make the complete transplant —remapping the sensor to keep Touch ID valid. But for some, the

loss of Touch ID is worth an otherwise functioning phone. Lots of people don't live anywhere near an Apple store—so they go to a local shop or they do the repair on their own.

> I don't think Error 53 was intentional—I think it was a mistake. But I think it's a mistake that Apple is taking advantage of.

Post-repair, those iPhones don't have Touch ID—but life goes on. Owners use their passcode for security instead—they go on Snapchatting and selfie-ing as before. Sometimes for months. Until they plug into iTunes and update iOS. Then, boom! Error 53, and a bricked phone.

I run iFixit, the free online repair manual. Our community of repair experts help people fix their electronics—and we sell the parts and tools for repairs. Error 53 has been lighting up our forums for months. When the error made national headlines, people asked me: Is Apple trying to kill the third-party repair industry?

Officially, Apple says no. They say that Error 53 is a security measure—or as Apple put it, "Error 53 is the result of security checks designed to protect our customers." An Apple spokesperson also told *The Guardian*,

> We protect fingerprint data using a secure enclave, which is uniquely paired to the touch ID sensor. When iPhone is serviced by an authorised Apple service provider or Apple retail store for changes that affect the touch ID sensor, the pairing is re-validated. This check ensures the device and the iOS features related to touch ID remain secure. Without this unique pairing, a malicious touch ID sensor could be substituted, thereby gaining access to the secure enclave. When iOS detects that the pairing fails, touch ID, including Apple Pay, is disabled so the device remains secure.

Apple *is* serious about security. It has led the charge to protect users' data and privacy—from end-to-end encryption in iMessage to pushing back against the FBI seeking a backdoor into phones. Its policy proposals are spot-on. Google's silence on end-to-end encryption is deafening. Tim Cook's outspoken stand in favor of individual privacy is principled and technically sound.

That said, I've got a couple bones to pick.

As far as I can tell, Error 53 is *not* a security measure. Any more than using an iPhone 5—a phone that's never had a fingerprint sensor to begin with—is a security risk.

A phone with a third-party replaced home button is is still “protected by passcode lock and iCloud lock,” says iDevice expert Jessa Jones. “‘New’ home buttons that do have a fingerprint sensor (i.e. one from another original iPhone) do not have functional Touch ID because it is not the original button. Apple Pay by Touch ID is already disabled. What gain is there to brick the phone at update?”

If the problem is abuse of the Touch ID function, then great, swapping home buttons disables that functionality—problem solved. There’s no evidence that a “malicious” or “fraudulent” touch ID sensor even exists. I know the aftermarket backward and forward, and my connections in Asia and around the world have no knowledge of any malicious parts. OK, OK maybe the malicious parts haven’t been invented yet. But is Apple *really* going to be that forward-thinking? According to its upgrade cycle, I should be throwing this phone away in favor of the iPhone 7 in a little over six months.

Apple also told *The Guardian* that “when an iPhone is serviced by an unauthorised repair provider, faulty screens or other invalid components that affect the touch ID sensor could cause the check to fail… ” That sounds reasonable, but Error 53 has nothing to do

with faulty aftermarket parts. We've reproduced the error with new OEM parts from a different iPhone. Error 53 is a matter of part synchrony, not bad parts.

Writes Jones: "The statement from Apple is another 'dig' at independent repair in the battle to get people to stop fixing their phones and just upgrade already."

I'm forced to agree. It's no secret that Apple has been resistant to repairs outside of its network. Unlike other manufacturers like Dell and HP, it limits outside access to replacement parts, service information, and service tools. At the moment, Apple has the ability to "re-validate" a Touch ID sensor. Owners and professional repair techs don't. I don't think Error 53 was intentional—I think it was a mistake. But I think it's a mistake that Apple is taking advantage of.

Such tactics aren't new.

As early as 1956, IBM got in major trouble after refusing to allow third-parties to repair or upgrade its machines. So did Kodak in 1992. And so did Avaya in 2014. There are many more examples—but the courts have been clear: you can't create a monopoly around repair.

Despite the legal precedent, electronics makers usually default to ‘no’ when it comes to outside repairs. Nikon, for example, made headlines in 2012 when it stopped selling replacement parts to independent repair shops—funneling repairs instead to its own centers. That same year, Toshiba drew the ire of consumers when it demanded the mass takedown of service manuals from a repair tech’s website. Or there’s the HTC One, which was nearly impossible to disassemble and fix—unless you had a super secret tool that apparently only HTC possessed.

There are some electronics makers that are doing it right, like Fairphone—which sells replacement parts and provides service information to anyone who asks. But companies like that are more the exception than a rule.

They shouldn’t be.

> Repair is repair—whether it’s auto repair or iPhone repair.

When you swap the tires on your Ford Explorer, you must rebalance them. You don’t have to go to Ford for that—the corner repair shop has the tools to do it. Most wouldn’t put up with any automaker who limited maintenance to “authorized” repair shops. If

you want to, you can pay a bit more to go to the dealer—but (and here's what's important) that's *your* choice.

Why do we have this choice? Because someone fought for your right to get your car fixed where you want. But those laws got outdated, and so manufacturers started restricting independent access to electronic diagnostics—arguing that modern security required these precautions to protect owners against thieves and hackers. (Sound familiar to Error 53?)

It's a familiar tune and voters were sick of it. So sick, in fact, that Massachusetts voters overwhelmingly passed a Right to Repair law in 2012, giving independent car technicians access to the same diagnostic tools, service information, and security reset software that the dealer's mechanics have. Once the law passed in Massachusetts, automakers agreed to apply the same terms nationwide.

Repair is repair—whether it's auto repair or iPhone repair. As a repair professional, I have a bias, of course. But it's a bias in favor of fixing a problem. Error 53 is a manufactured problem. Apple should focus on what they do best—manufacturing products—and back off on making problems. Owners should be able get their

phones repaired where they please: at home, with the original manufacturer, or with an independent repair shop.

Just last week, iFixit (my organization) teamed up with dozens of other repair shops, reuse organizations, and recycling companies to launch repair.org—a group that represents consumer and professional repairers. We're fighting for your right to repair your stuff. We've already helped introduce legislation in several states that would allow consumers to get their products repaired where they please.

Because no company should be allowed to destroy your phone in a fit of jealous rage, just because you decided to date a different repair shop.