Nikon D5100 Teardown

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INTRODUCTION

It seems as though all the hot new electronics these days are tablet-this, phone-that. Frankly, our engineers had enough. Their spudgers were getting soft; we needed to do something that would present a *challenge* and get them sharp again -- none of the take-off-a-display-to-find-a-motherboard baloney.

We knew exactly where to turn. We've done a set of Nikon D70 repair guides in the past, and we saw how difficult it was to take apart an SLR. What better way to infuse a bit of fun in our teardowns than taking apart another SLR?

So, in the name of science and all that is right in this world, let's see what's inside the brand-new Nikon D5100!

TOOLS:

- Tweezers (1)
- Phillips #00 Screwdriver (1)
- iFixit Opening Tools (1)
- Soldering Iron (1)

Step 1 — Nikon D5100 Teardown

- We here at iFixit are very fond of cameras. It is our pleasure to provide our fans with what we believe will be an amazing teardown. Without any further ado, we present the D5100 teardown.
- The first thing we noticed about the D5100 was that the body was nowhere near the same heft as our standard workhorse camera, the D90. It just felt... punier.
- And then we took some photos with it.
- The photos came out amazing. The colors were crisp, and we could even get away with usable (albeit super-grainy) ISO 6400 shots, which is certainly not the case with the D90's ISO 3200.
- For those who need a brush up on the definition of ISO, [click here].

Step 2

- The flippy rotating screen is very useful -- especially if you're trying to record yourself for YouTube.
- Unlike the D90, the top of the camera does not include an informational LCD. Instead, we get the rotating mode selector on the right.
- The specs:
  - 16.2 MP DX-format CMOS sensor
  - 4 FPS continuous shooting
  - 3.0 inch, 921,000-dot display
  - 1920x1080 recording at up to 30 FPS
  - 11-point AF (auto-focus) system

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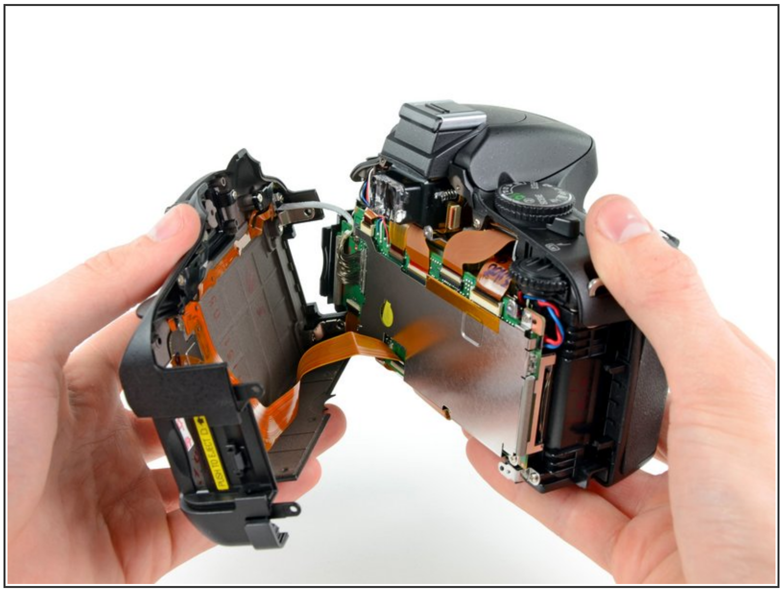
Step 3

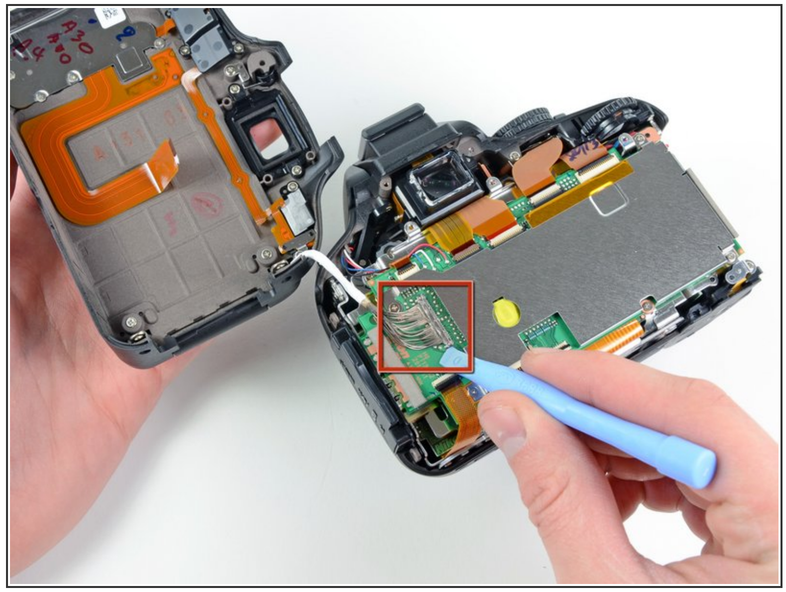
- First thing's first: take out the battery. We don't want any electric juice running through the D5100's veins while we're taking it apart.
  - Especially not to the large-and-in-charge 330µF flash capacitor.
- The 7.4 V 1030 mAh EN-EL14 Li-ion battery is used by the D5100, D3100, and the COOLPIX P700. Sadly, it's *not* compatible with other cameras in the Nikon lineup, such as the D90 and D7000.

Step 4

- The camera has roughly 4 billion screws holding it together. We'll be skipping a lot of the "unscrewing this screw" pictures (like the ones shown in this step) in order to keep the teardown interesting.
- Trust us, after the 50th screw, it gets boring.
- As if exposed screws weren't enough, Nikon also chose to hide screws underneath covers and the rubberized thumb grip.

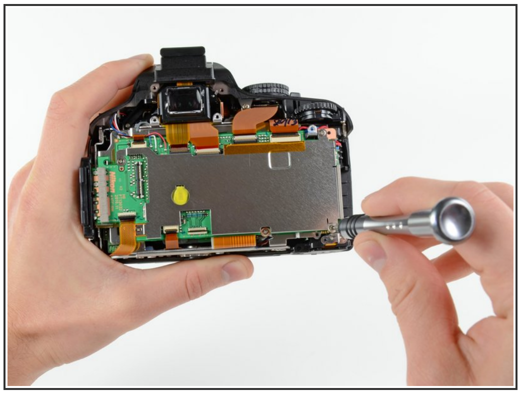
Step 5

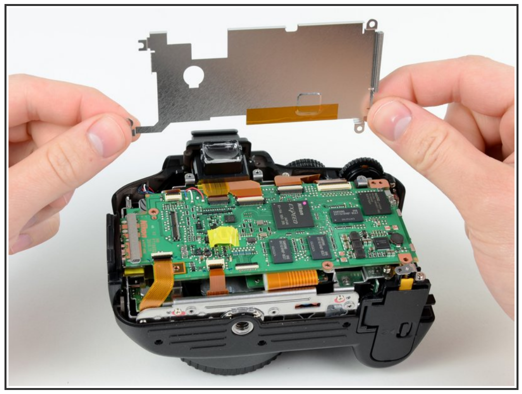


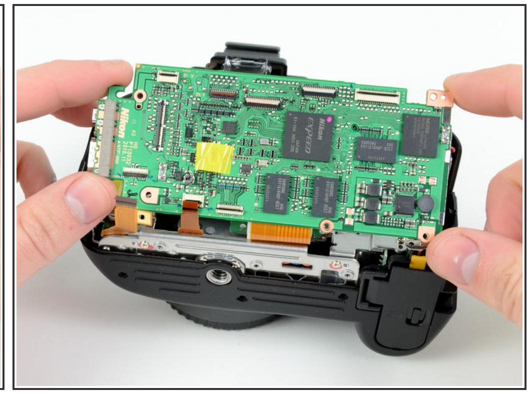


- After a good twenty #00 Phillips screws were removed from the perimeter of the device, we managed to separate the rear cover.
- A ribbon cable for the rear control buttons and a hefty 40 pin cable responsible for transmitting information to the rear display still attached the rear cover to the rest of the camera.
- Fun fact: to eliminate the complexities of a slip ring on the rotating rear display, its motion is limited to 180 degrees.

Step 6

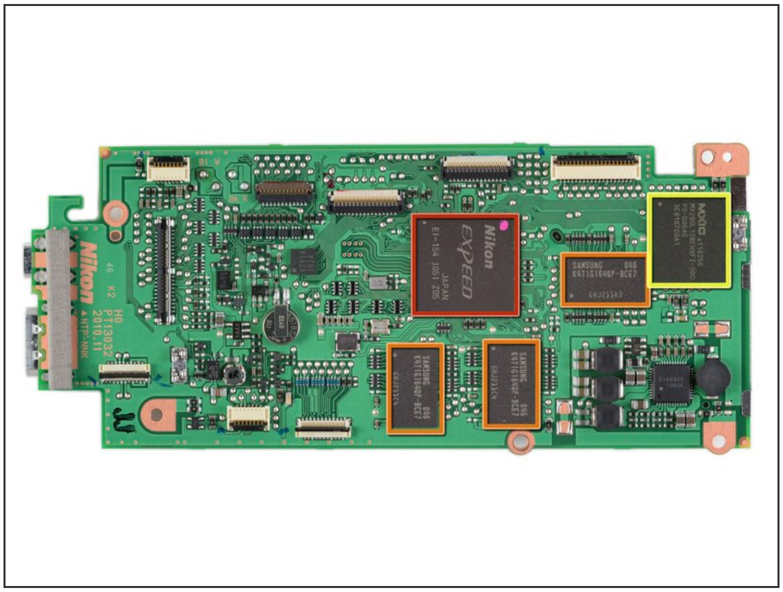


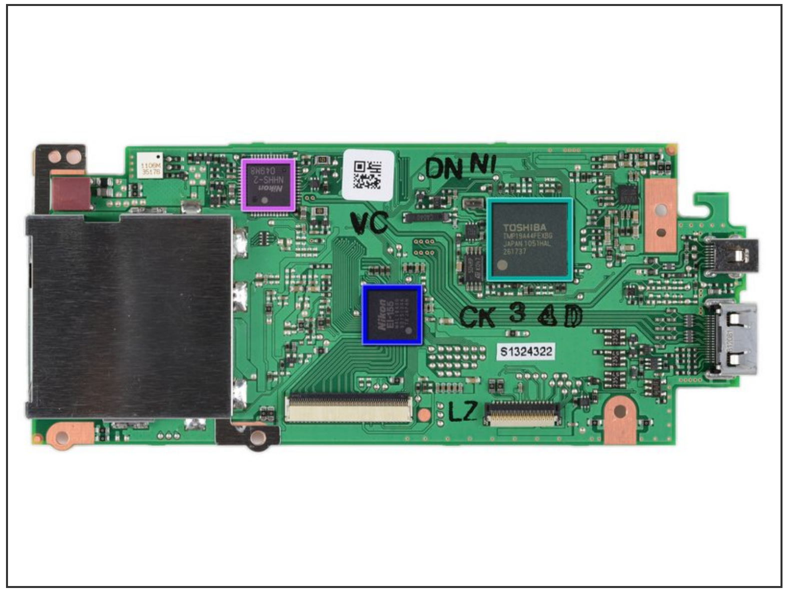




- After removing a couple more screws, the protective steel shield was removed from the motherboard.
- Then we had the pleasure of disconnecting nine cables (not all can be seen) and de-soldering a few wires; finally, the motherboard was lifted out of its home.

Step 7





- Front view of the motherboard. (High-res version of the motherboard, [click here]):
  - Nikon EXPEED 2 EI-154 1051 Z05 image processor
  - Samsung [K4T1G164QF-BCE7] 1Gb DDR2-800 SDRAM (total of 3 Gb = 384 MB)
  - MXIC [MX29GL128EHXFI-90G] 128 Mb parallel flash memory
- Rear view of the motherboard. (High-res version, [click here)]:
  - Toshiba [TMP19A44FEXBG] low-power microcontroller
  - Nikon EI-155 M4L1BA00 00151044
  - Nikon NHHS-2 049M8

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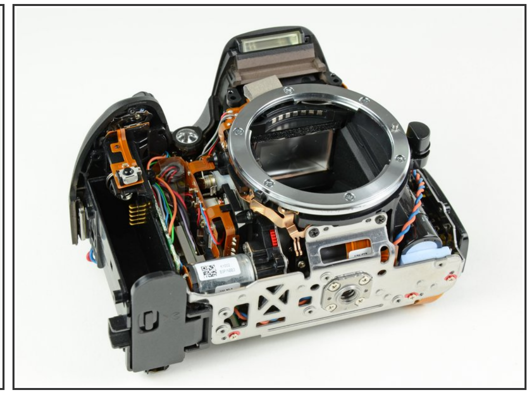
Step 8

- After much time spent hunting around to figure out how the front cover was attached, we decided to peel off the rubber grip beneath the shutter button.
- And we found the answer. To remove the front cover, a bunch more creatively-placed screws had to be removed.

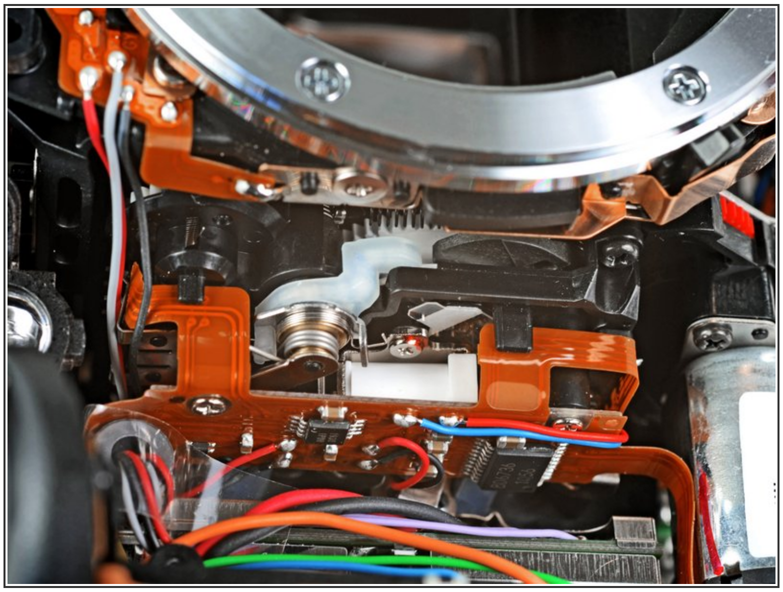
Step 9

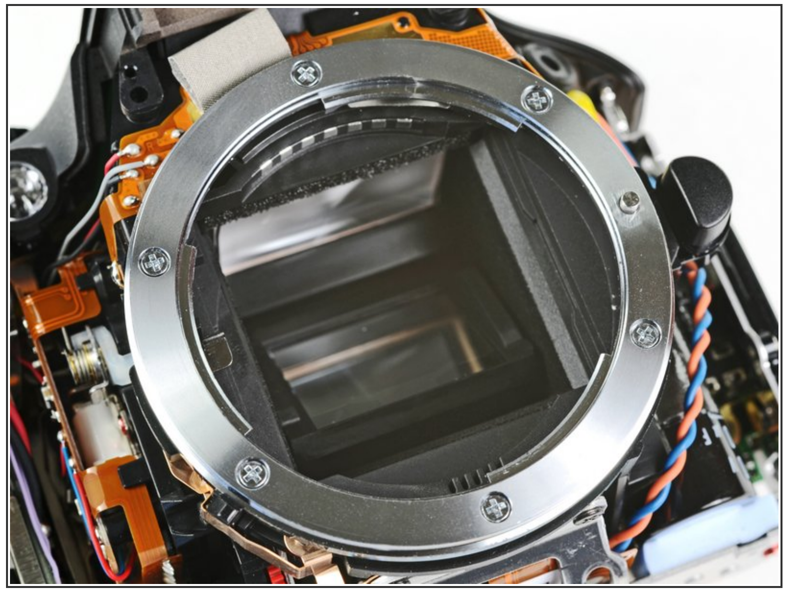


- And just like that, the front cover can be pulled off the camera body.
- With it gone, you can get a good look at most of the components that make the D5100 roar.
- An electric motor (presumably linked to the shutter) can be seen next to the battery door, and the gigantic flash capacitor is housed right behind the lens release button.

ⓘ The light blue pad wedged between the end of the flash capacitor and the bottom frame conducts heat away from the capacitor to cool it down during flash-intensive shooting.

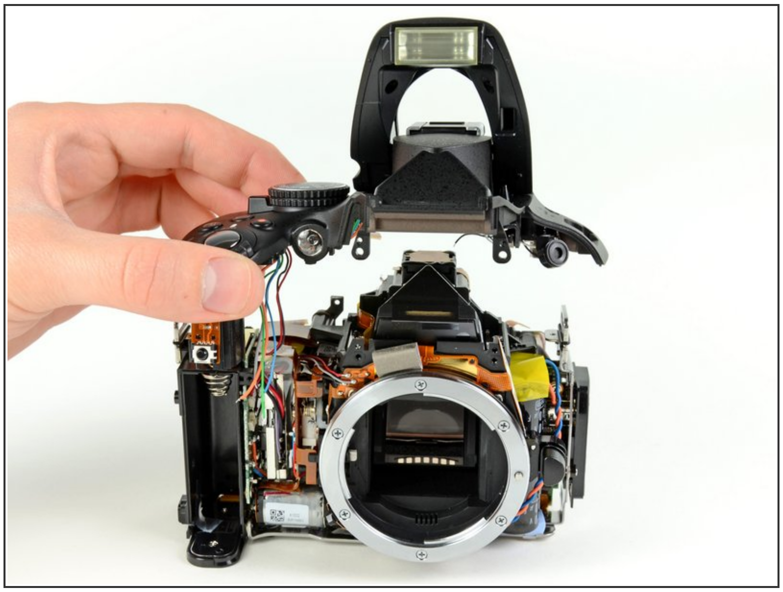
Step 10

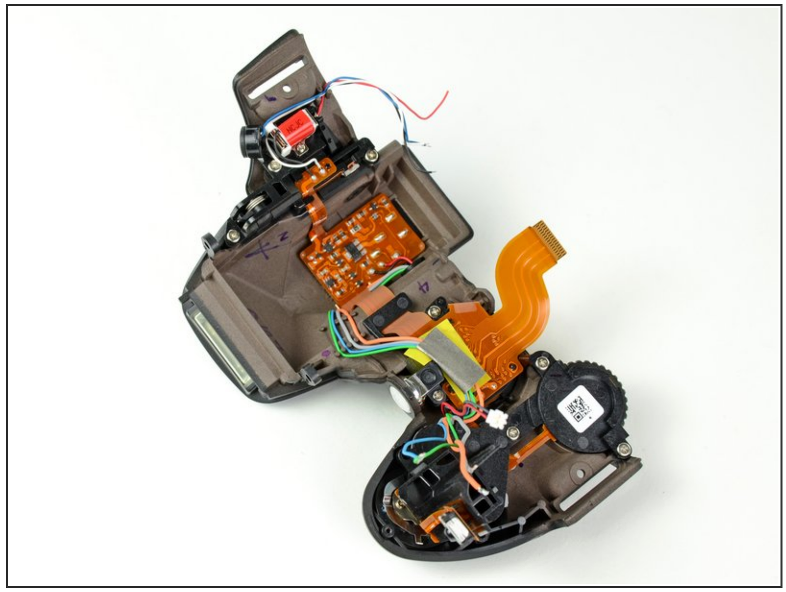




- Nothing to explain here. We're just amazed by the dizzying amount of electromechanical systems contained within a mid-priced SLR camera. Just look at all that stuff!
- Feel free to use these photos as wallpapers. Check them out in full size: Photo 1 and Photo 2

Step 11

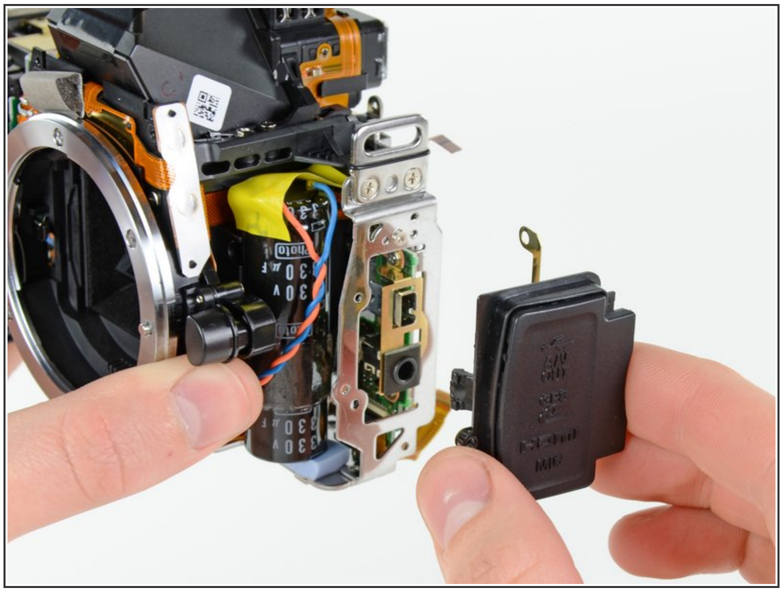




- The top cover is a feat of engineering by itself. Within its walls are contained:
  - Main control wheel, shutter/aperture control wheel, live view lever, On/Off switch, "info" button, record button, shutter button, exposure compensation button, IR sensor, AF lamp, flash, flash control circuitry, flash actuator, and the microphone.

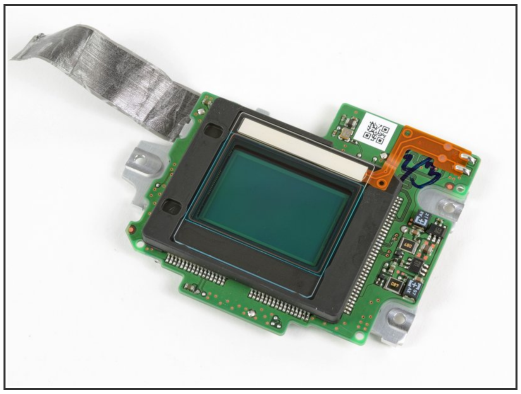
The flash is actuated by a linear solenoid that pushes on a lever to release the spring-loaded flash -- either automatically if the sensor detects a low-light situation, or when the flash button is depressed.

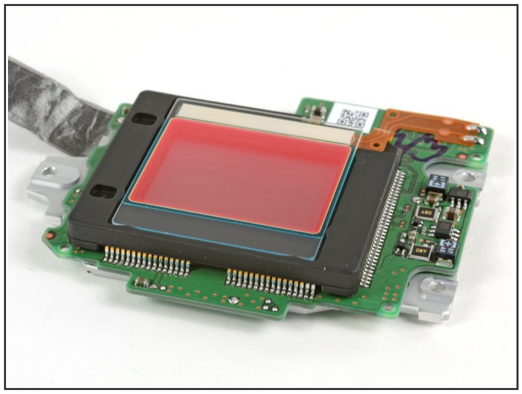
Step 12

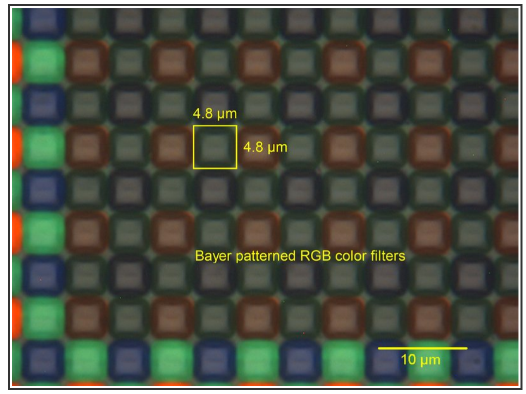


- It's time to take a look at the D5100's sensor. To get to it, we have to first remove the side cover for the ports, as well as the frame surrounding the ports.
- With a couple more twists of a screwdriver, and a couple more cables disconnected, the sensor board comes out!

Step 13







- The D5100 utilizes a 16.2 megapixel DX format CMOS sensor to capture images.
  - This sensor has the same specs of the sensor used by the Nikon D7000.
- Chipworks reports that each pixel is 4.8 µm wide. That's about half the diameter of a red blood cell!
- The sensor has a special glass cover that turns red when viewed at an angle. Neat! (This is the "hot mirror," which filters out the infrared spectrum.)

Step 14

- Nikon D5100 Repairability Score: **2 out of 10** (10 is easiest to repair)
  - The battery can be easily replaced by opening the compartment with your thumbnail.
  - The rear cover comes off with minimal unscrewing/desoldering (for this kind of device), allowing you to access the motherboard.
  - The D5100 has several wires that need to be desoldered in order to take it apart.
  - Approximately 4 billion screws hold the device together.
  - Components are very tightly packed, making it more difficult to disconnect and remove them.
  - For absolute safety, you need to discharge the flash capacitor, otherwise you risk accidentally killing your camera.

To reassemble your device, follow these instructions in reverse order.