



# HP LaserJet 1320 Teardown

The first laser printer teardown on iFixit

Written By: jdp23



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# INTRODUCTION

The first laser printer teardown on iFixit.



## TOOLS:

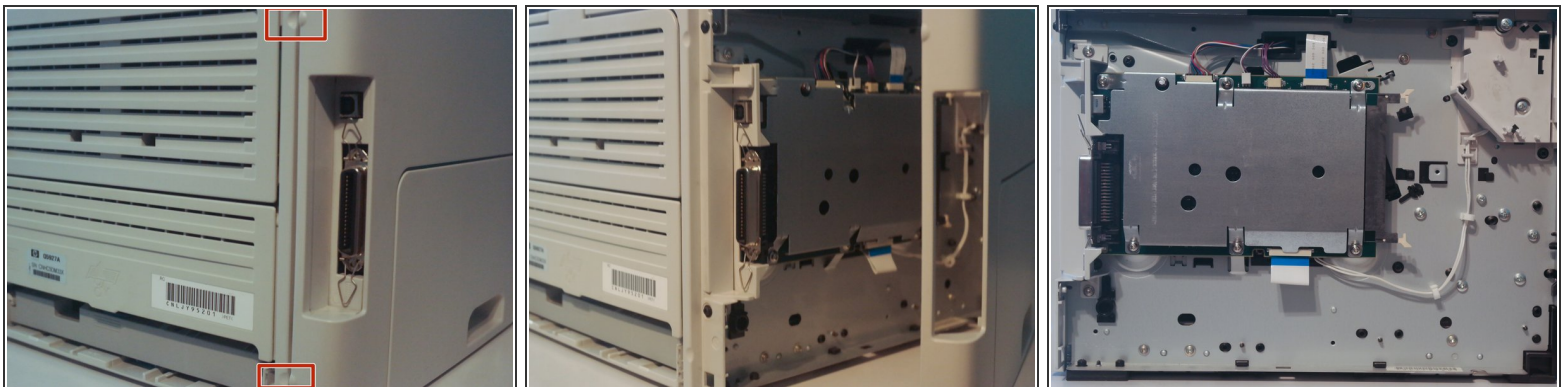
- [Metal Spudger Set](#) (1)
  - [Tweezers](#) (1)
  - [Phillips #0 Screwdriver](#) (1)
  - [Phillips #1 Screwdriver](#) (1)
  - [8" Needle Nose Plier](#) (1)
  - [Digital Multimeter](#) (1)
  - [PoziDriv #0 Screwdriver](#) (1)
  - [PoziDriv #1 Screwdriver](#) (1)
  - [Screw Extracting Pliers](#) (1)
  - [Snap Ring Pliers](#) (1)
  - [Heavy-Duty Spudger](#) (1)
-

## Step 1 — The Printer



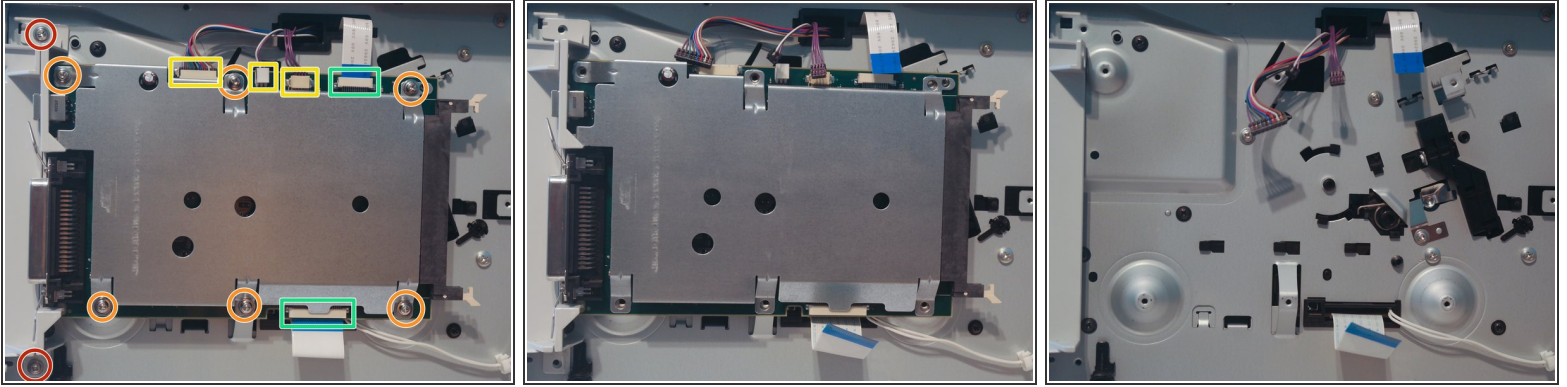
- This teardown of the HP LaserJet 1320 is officially the first laser printer teardown on iFixit.
- ⓘ It took almost 7 hours to take apart this amazingly complex printer.
- ⓘ Spoiler alert: It's really nice to see something this repairable.
- ⓘ Also, check out the [complete repair guide](#) for this printer!

## Step 2 — Left Side Cover



- According to the service manual (there is a link in the documents section), the left cover of the printer can be opened without any tools by pulling on 2 tabs.
- The service manual was right. For the record, this is actually easier than it sounds.

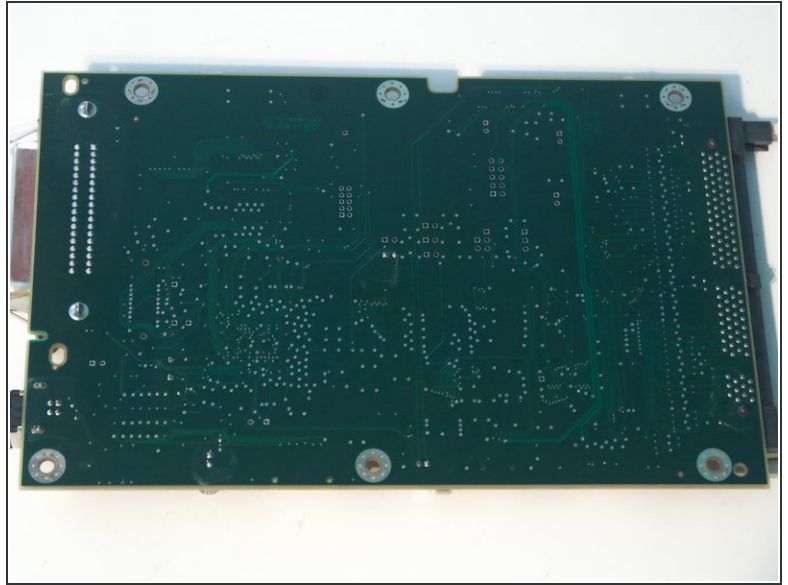
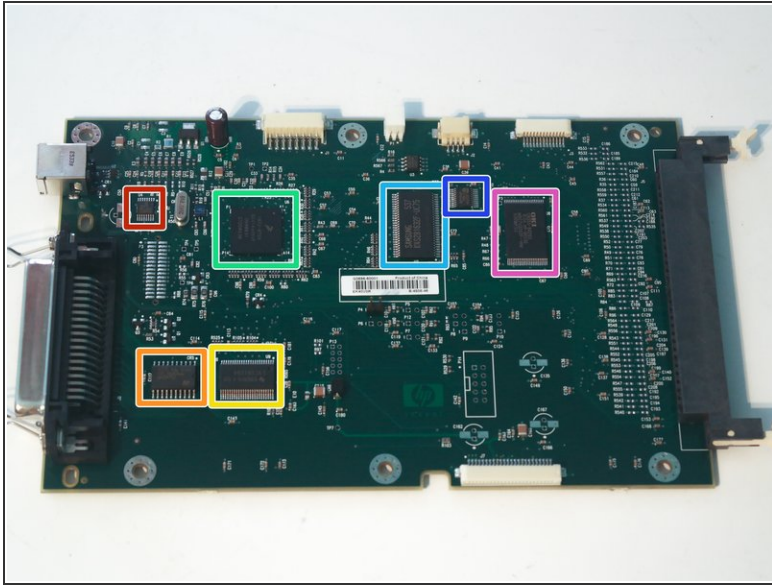
## Step 3 — Formatter Assembly



- Now on to the formatter.
  - Remove 2 screws on the I/O port cover.
  - Remove 6 screws on the formatter cover.
  - Disconnect 3 connectors to the laser assembly, the cartridge connector, and the control panel.
  - Disconnect 2 flat flexible cables to the laser assembly and the control board.
- i** While the service manual says not to use a PoziDriv screwdriver, I found that using a normal Phillips screwdriver on the screws in this printer would require excess force and damage the screws, but a PoziDriv screwdriver removed the screws without causing any damage.

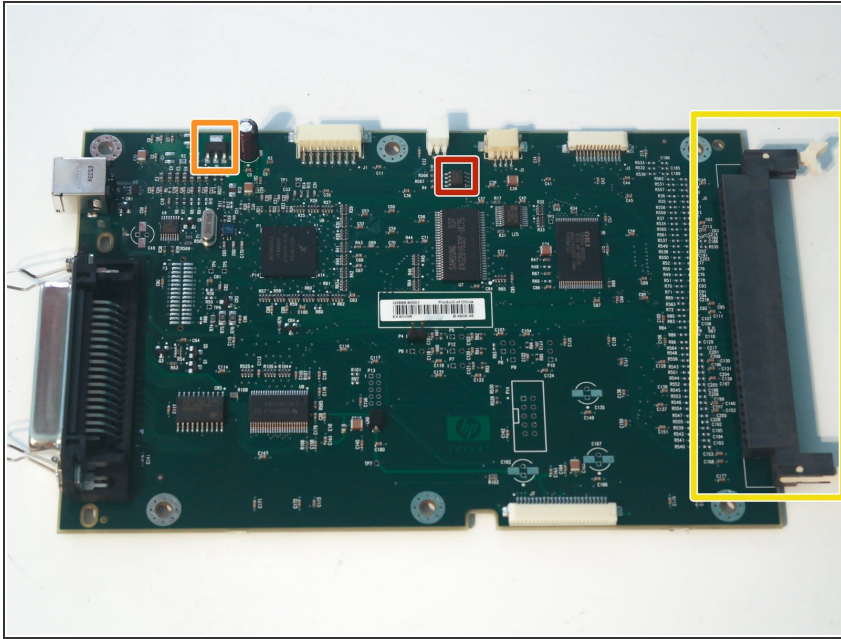


## Step 4



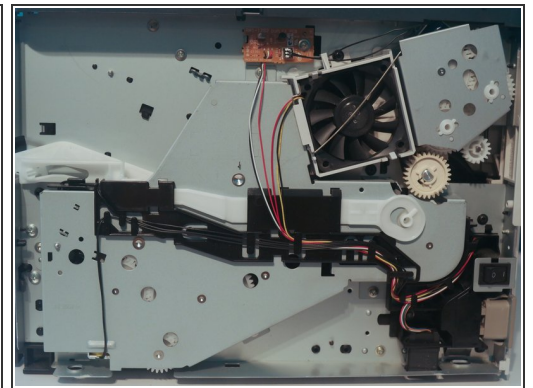
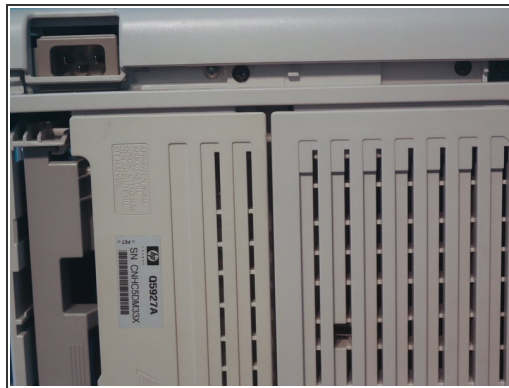
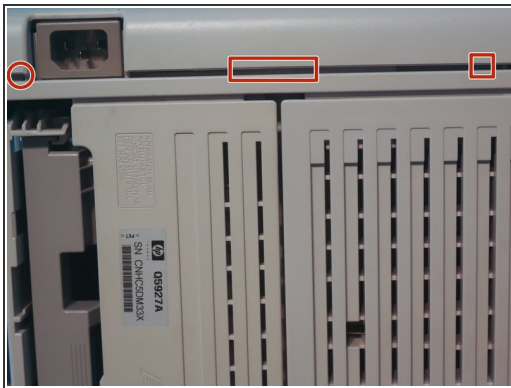
- Chips on the formatter:
  - [PCA9551 I2C LED Blinker](#). I never knew there was a chip with the sole purpose of blinking LEDs.
  - STMicroelectronics E6V2HP
  - [SN74LVC161284 19-Bit Bus Interface](#)
  - SC414445VF Proprietary ASIC
  - [K4S281632F-UC75 128Mb \(16MB\) SDRAM](#)
  - [74LVC573A Octal D-type Transparent Latch](#)
  - [MR27V3202F 32Mb \(4MB\) One-time Programmable ROM](#)

## Step 5



- More chips on the formatter...
  - [AT24C64 64Kb \(8KB\) 2-Wire Serial EEPROM](#)
  - [LD1117 Low Drop Voltage Regulator](#)
  - The large gray object on the right is a 100-pin DIMM slot for expanding the internal memory.

## Step 6 — Right Side Cover



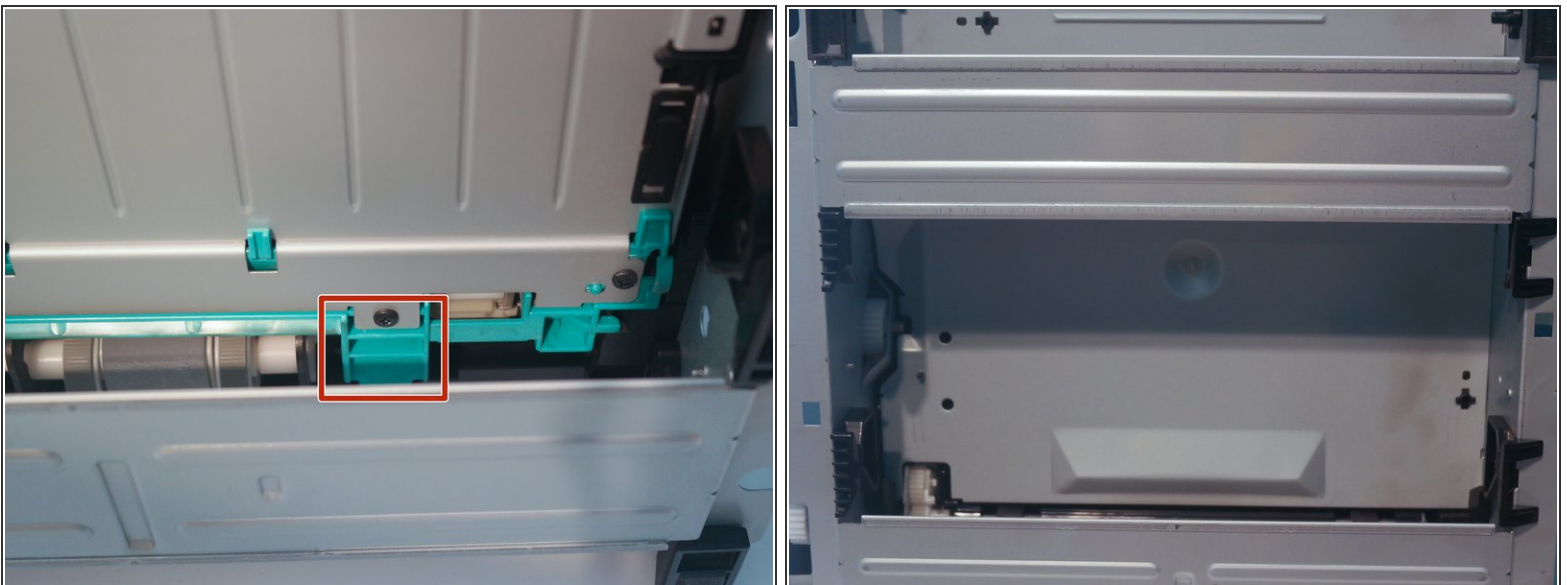
- Removing the right cover is as easy as disengaging 3 tabs with the printer turned on its side.

## Step 7 — Back Cover



- The back cover can be removed by removing 4 screws on the back of the printer.

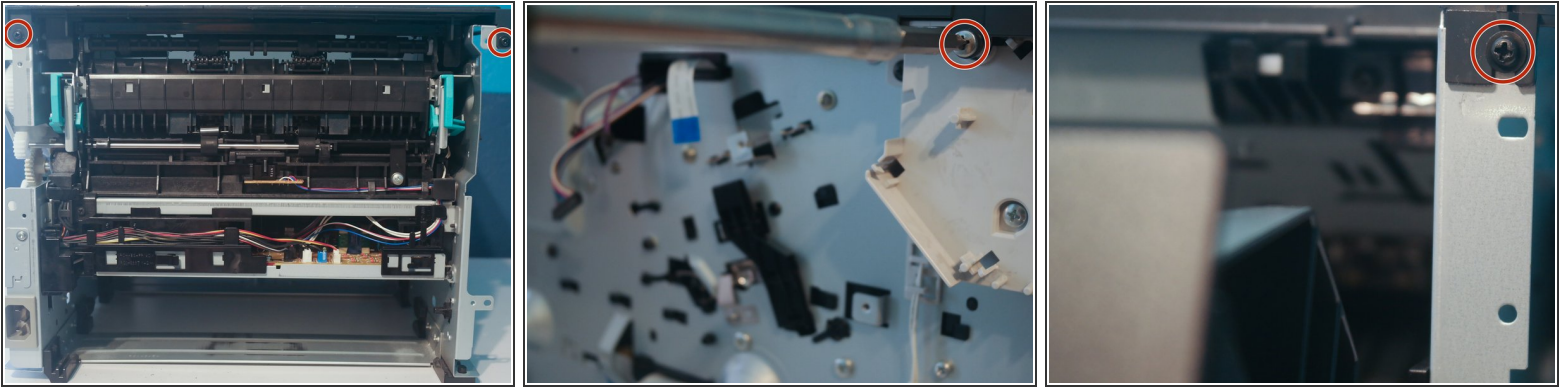
## Step 8 — Duplexer Tray



- The duplexer tray can be removed by pulling outwards on the ~~blue green~~ blue-green tab, which releases the magnets that hold the tray in place.

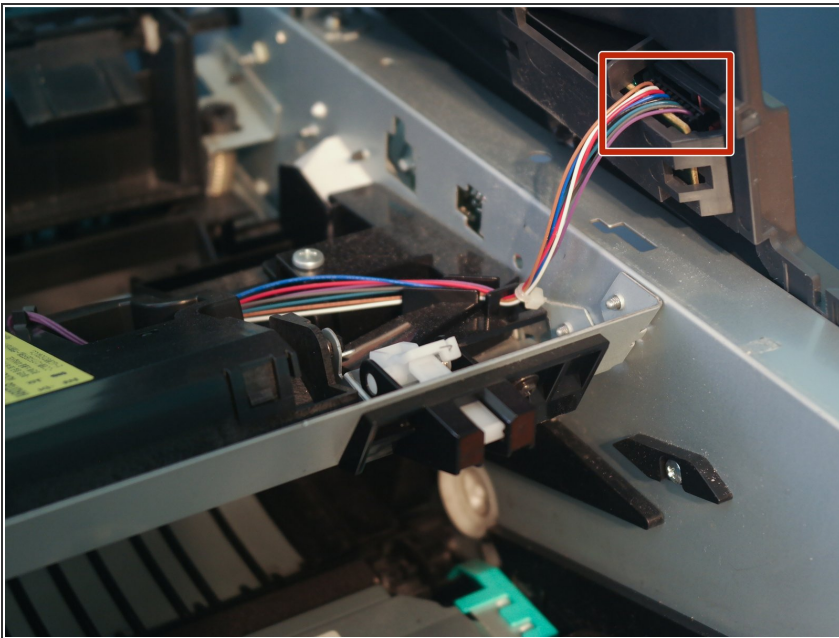


## Step 9 — Top Cover



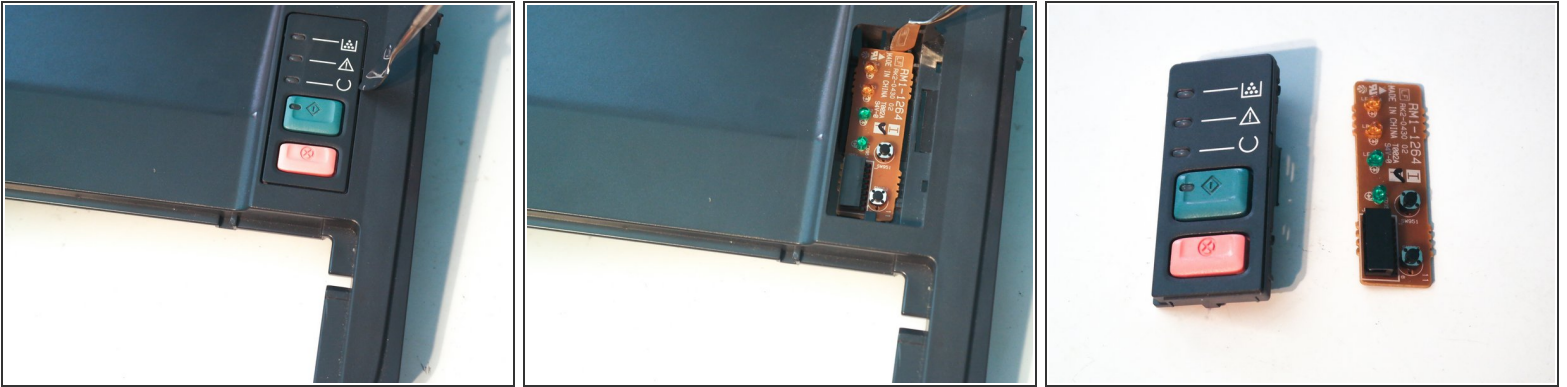
- Remove 2 screws on the back of the printer, one on the left side, and one on the front.

## Step 10 — Top Cover



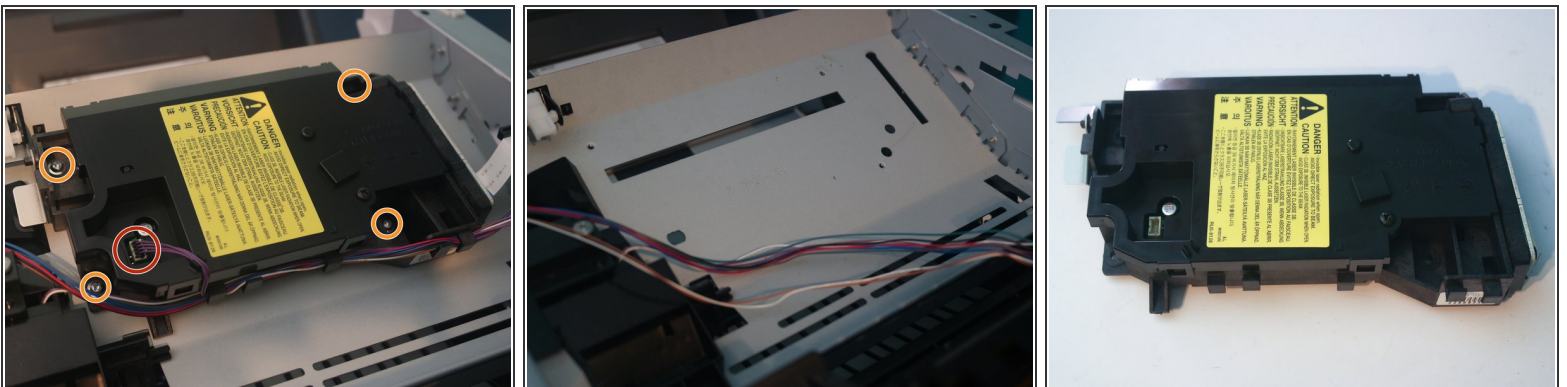
- After disconnecting the control panel cable, the top cover can be removed.

## Step 11 — Control Panel



- The control panel and its circuit board can easily be removed with a metal spudger.

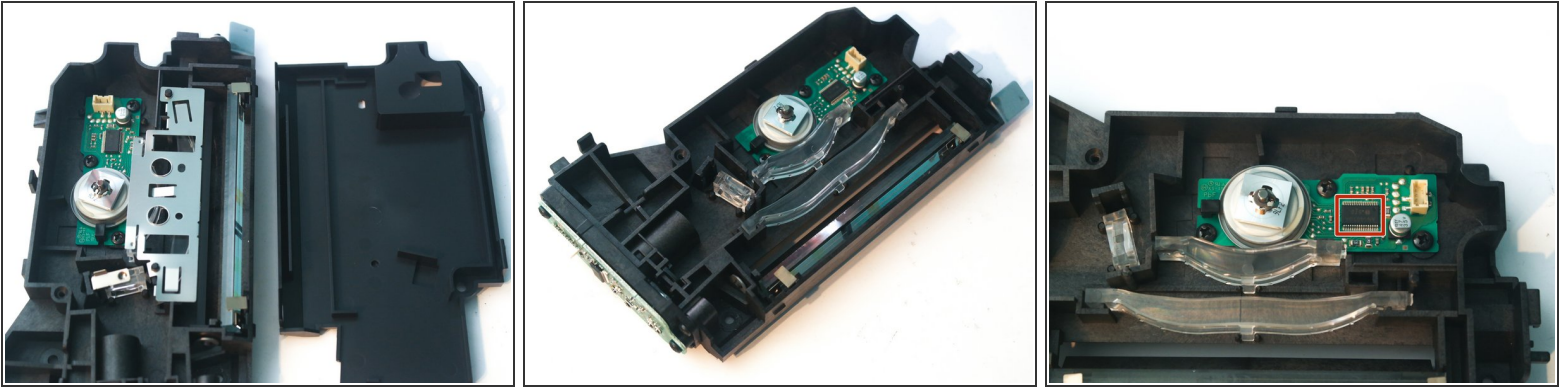
## Step 12 — Laser Assembly



- Remove one cable from the laser assembly.
- Remove 4 screws from the laser assembly.

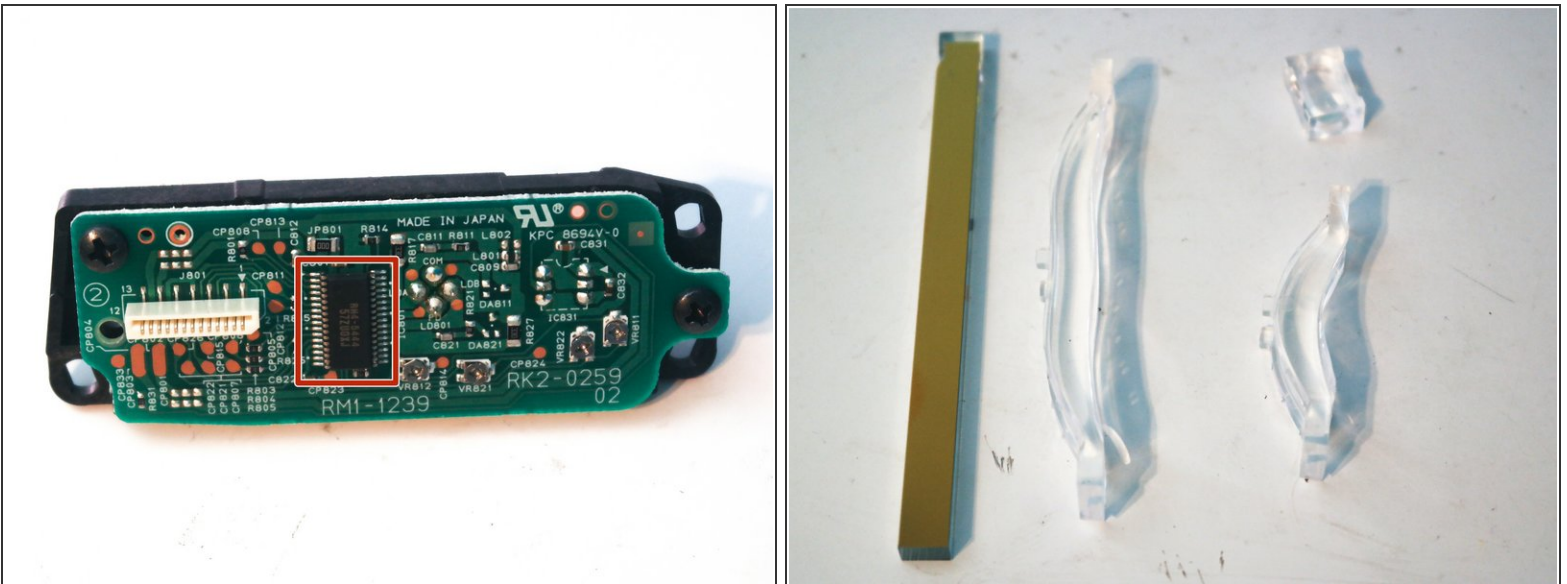


## Step 13



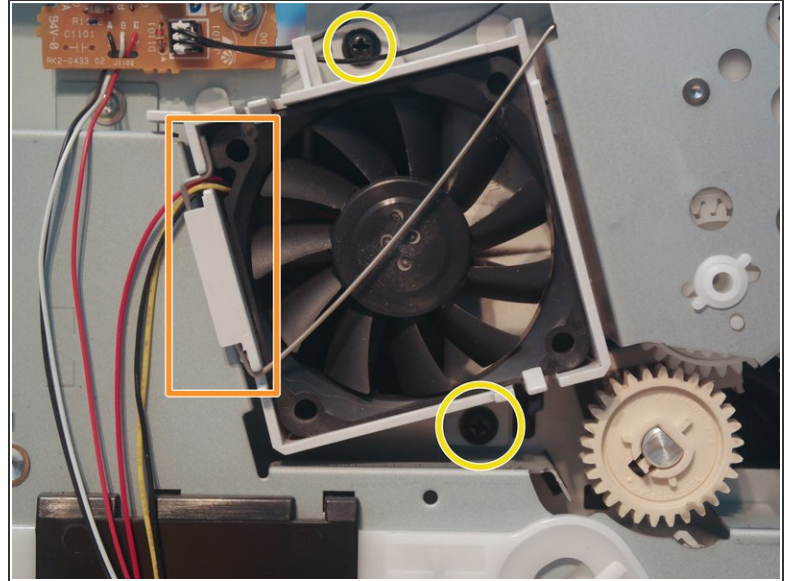
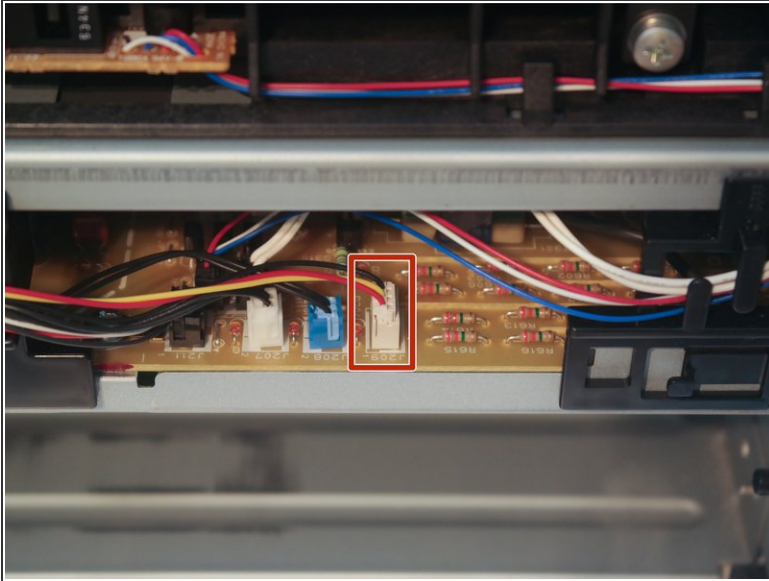
- After removing the cover and the clips holding in the lenses, the inside of the laser assembly can be seen.
- The chip on the motor board is an AN44010A, most likely some sort of brushless motor driver, although no datasheet could be found.

## Step 14



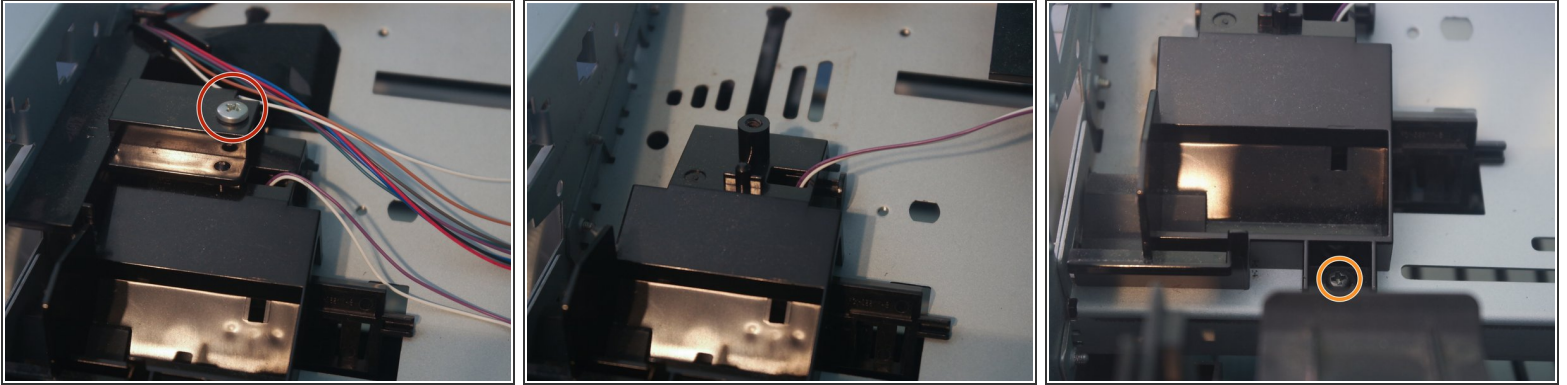
- The board mounted on the side of the laser assembly contains the infrared laser diode and a photodiode to sense the beam direction. It has a chip marked as RH4-5444, for which no datasheet could be found.

## Step 15 — Fan



- Disconnect the fan cable from the control board on the back of the printer.
- Remove the retaining clip from the fan.
- Remove 2 screws holding in the fan.
- While the fan can not be completely removed yet, this will make it easier to take apart other parts of the printer.

## Step 16 — Cartridge Connector



- Remove 1 screw from the top of the cartridge connector.
- Remove 1 screw on the front of the cartridge connector.
- The cartridge connector can be removed from the printer.

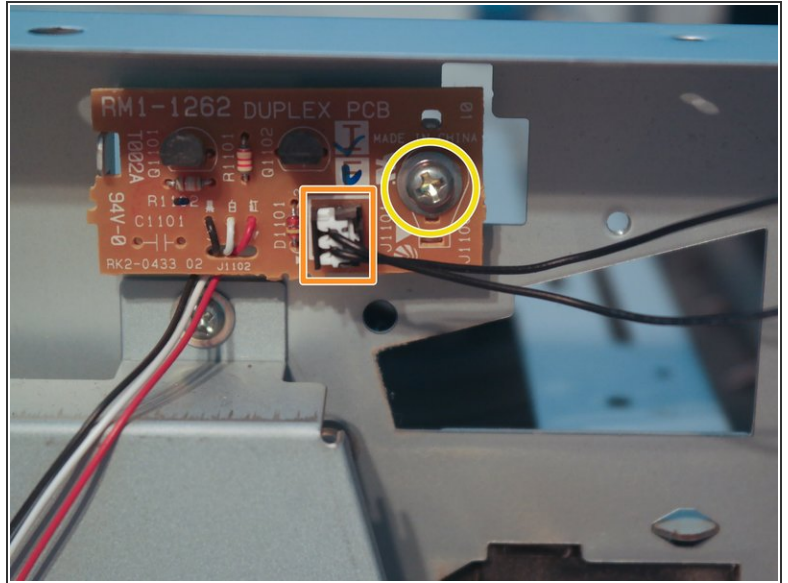
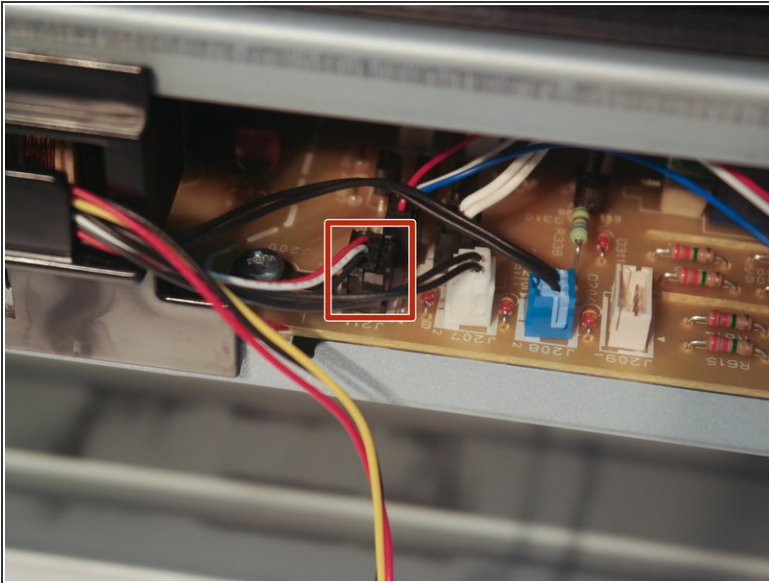
## Step 17 — Cable Clip



- The cable clip for the laser assembly cable can be removed from the chassis.

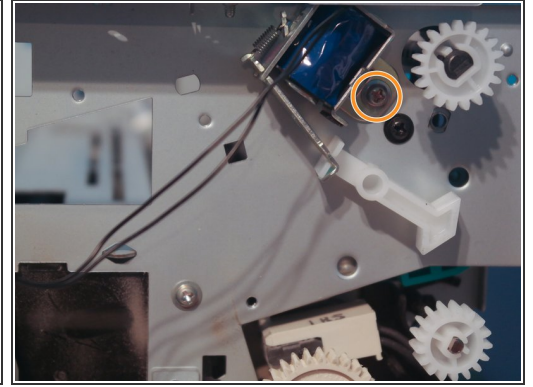
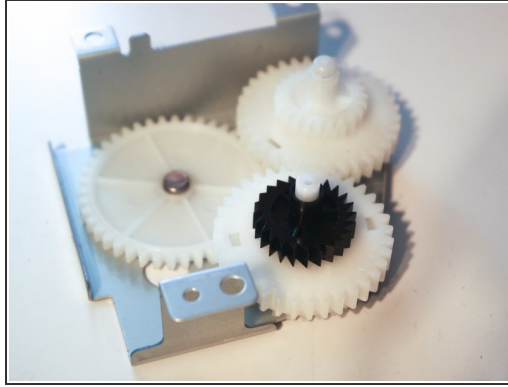
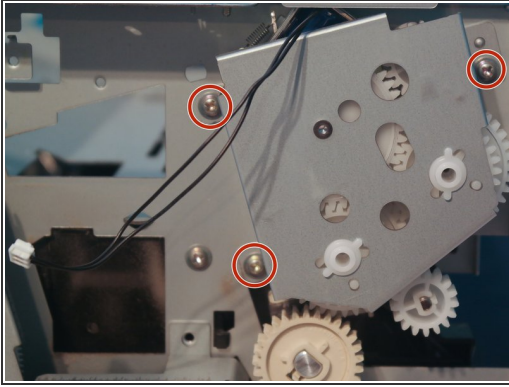


## Step 18 — Duplexer PCB



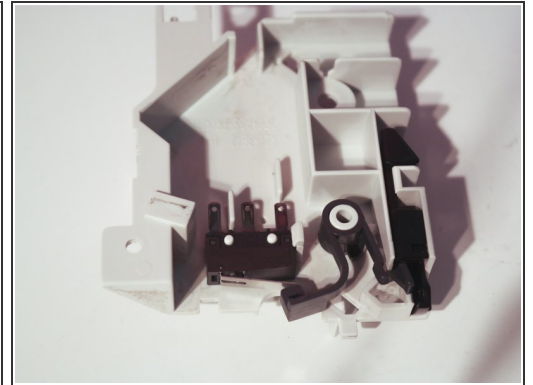
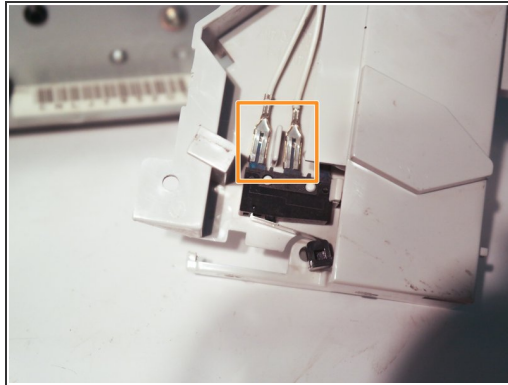
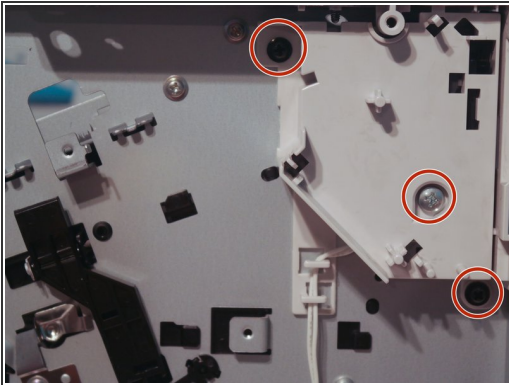
- Disconnect the duplexer cable from the control board.
- Disconnect the duplexer solenoid cable from the duplexer PCB.
- Remove one screw from the PCB and remove the PCB from the printer.
- This tiny board contains 2 NPN transistors marked [C2120](#) and [C1815](#), which are used to drive the duplexer solenoid.

## Step 19 — Duplexer Gears



- Remove 3 screws on the duplexer gear assembly.
- The duplexer gearbox can now be removed.
- Remove one screw holding down the duplexer solenoid.
- This appears to be a standard 24V open-frame solenoid, although no markings were found on it.

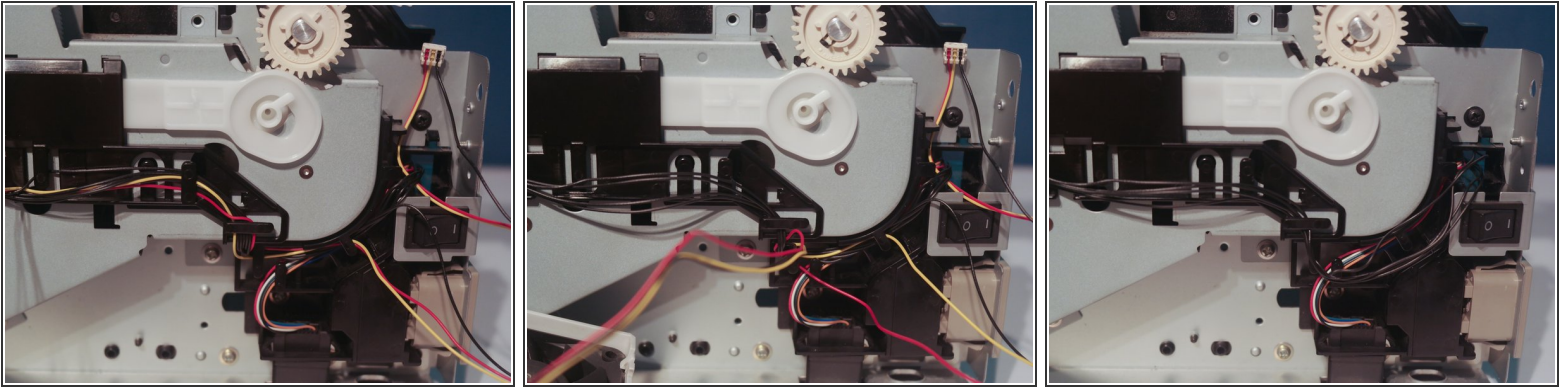
## Step 20 — Safety Interlock



- Remove 3 screws to remove the safety interlock assembly.
- Disconnect 2 spade connectors from the microswitch.
- The safety interlock prevents the lasers or high-voltage power supply from being turned on when the cartridge door is open.

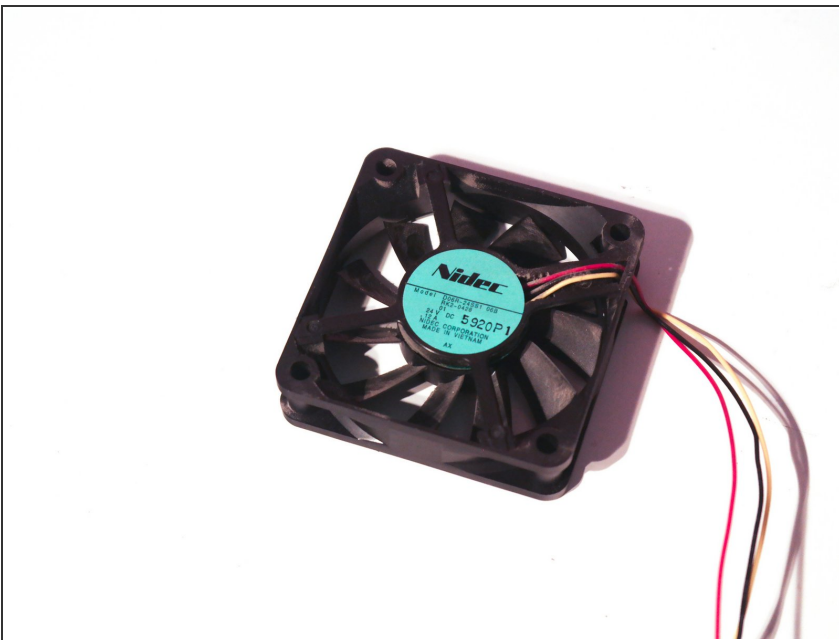


## Step 21 — Fan Cable



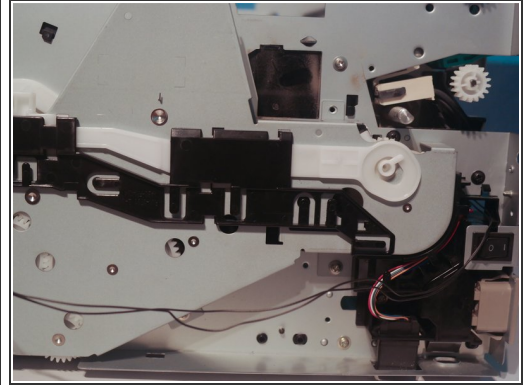
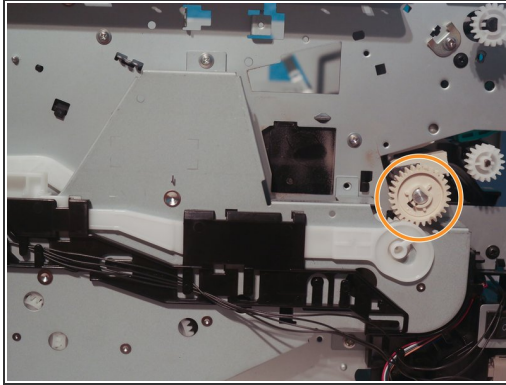
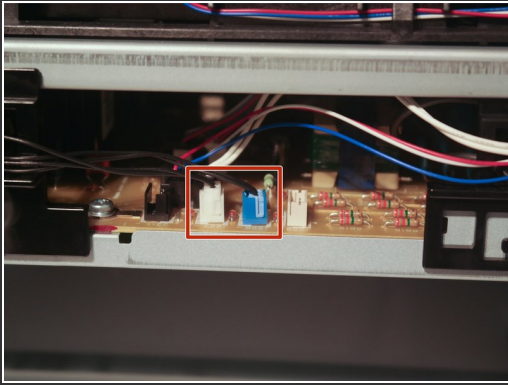
- The fan cable can now be derouted from the cable guide and the fan can be removed.

## Step 22



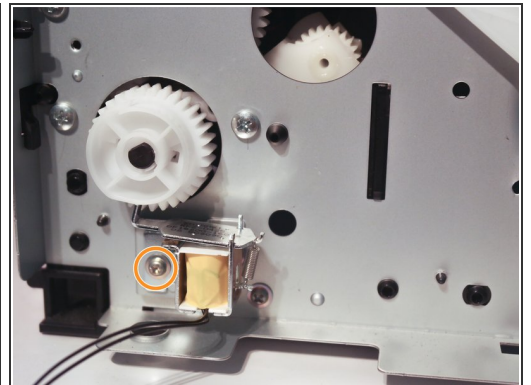
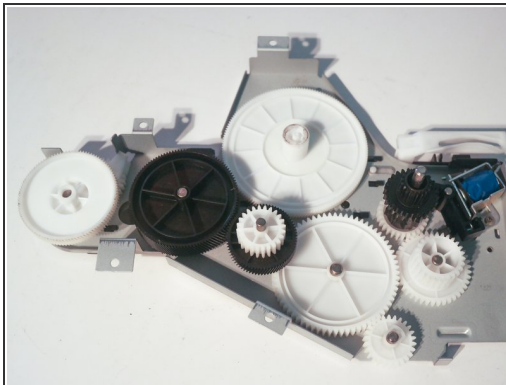
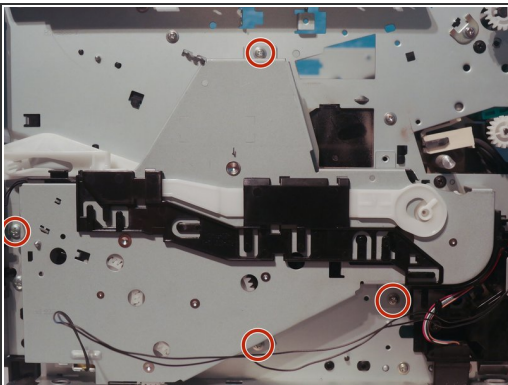
- The fan is a standard 24V brushless fan with a speed sensor manufactured by Nidec.

## Step 23 — Main Gear Assembly



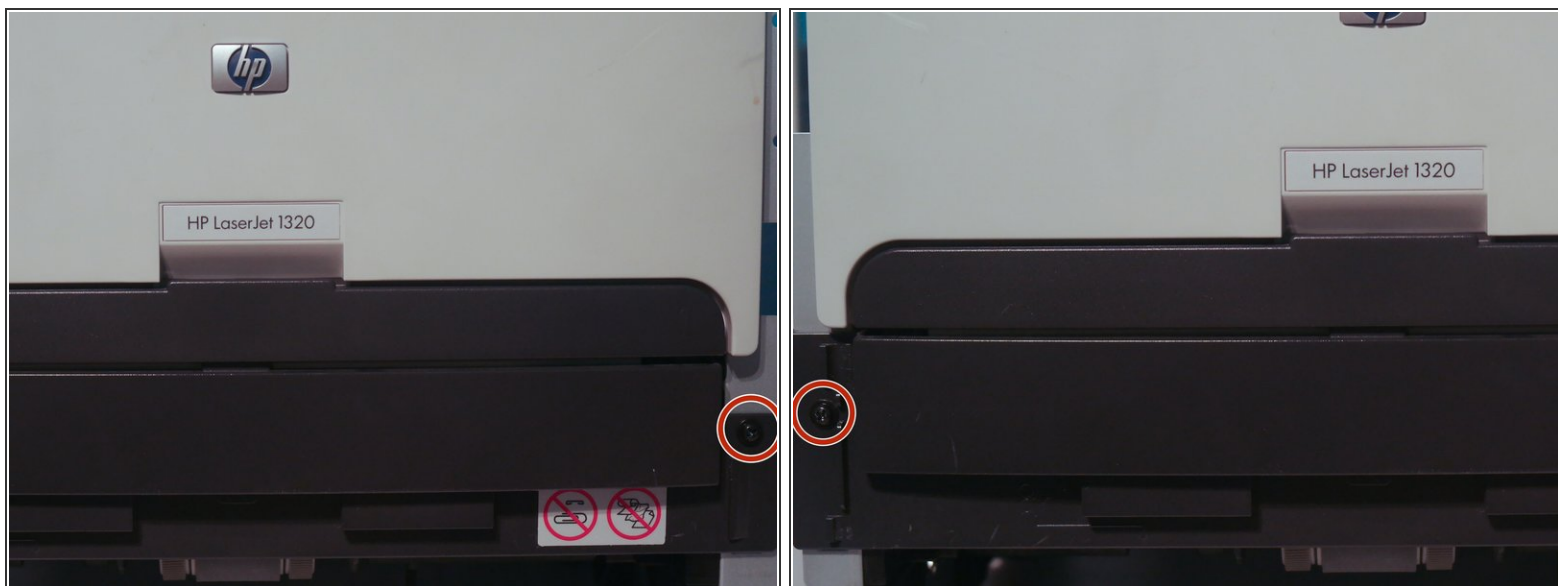
- Disconnect 2 cables from the control board.
- Remove the gear from the fuser shaft.
- Deroute the remaining cables in the cable guide.

## Step 24 — Main Gear Assembly



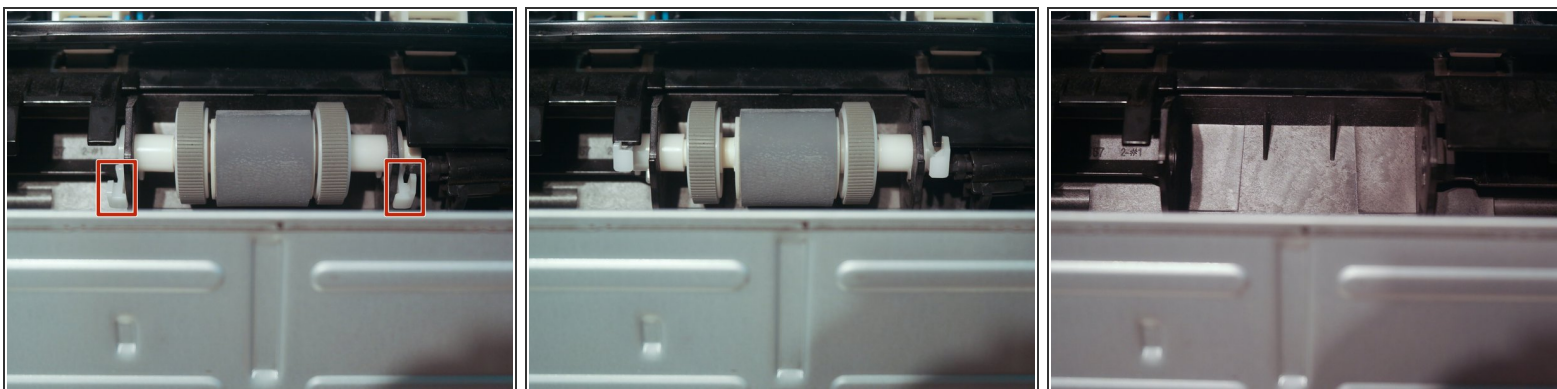
- Remove 4 screws to remove the main gear assembly.
- Remove 1 screw to remove the third solenoid.

## Step 25 — Cartridge Door



- The cartridge door can be removed by removing 2 screws on the front of the printer.

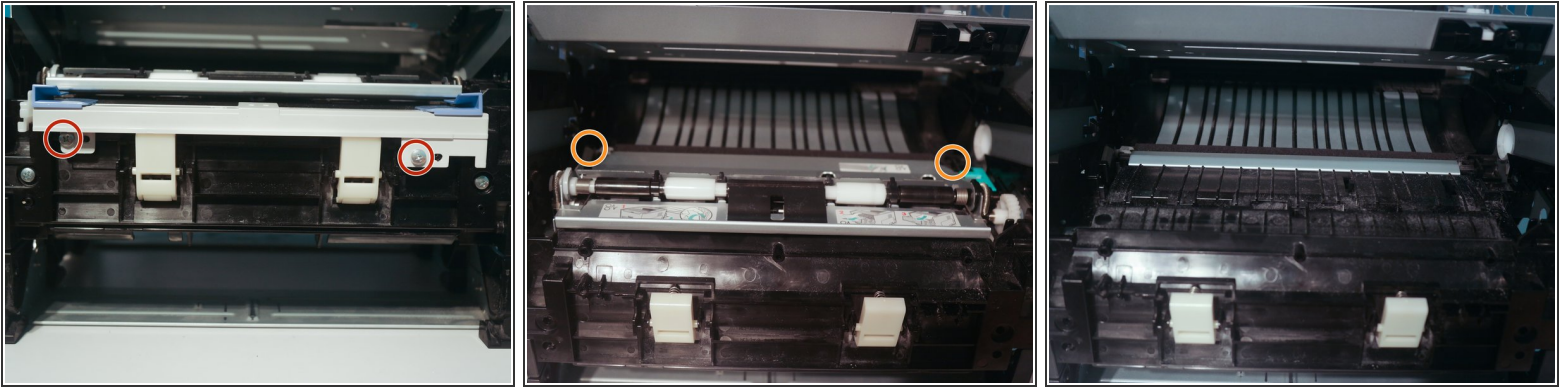
## Step 26 — Pickup Roller



- The pickup roller can now be removed by rotating the white tabs upwards and pulling them out.

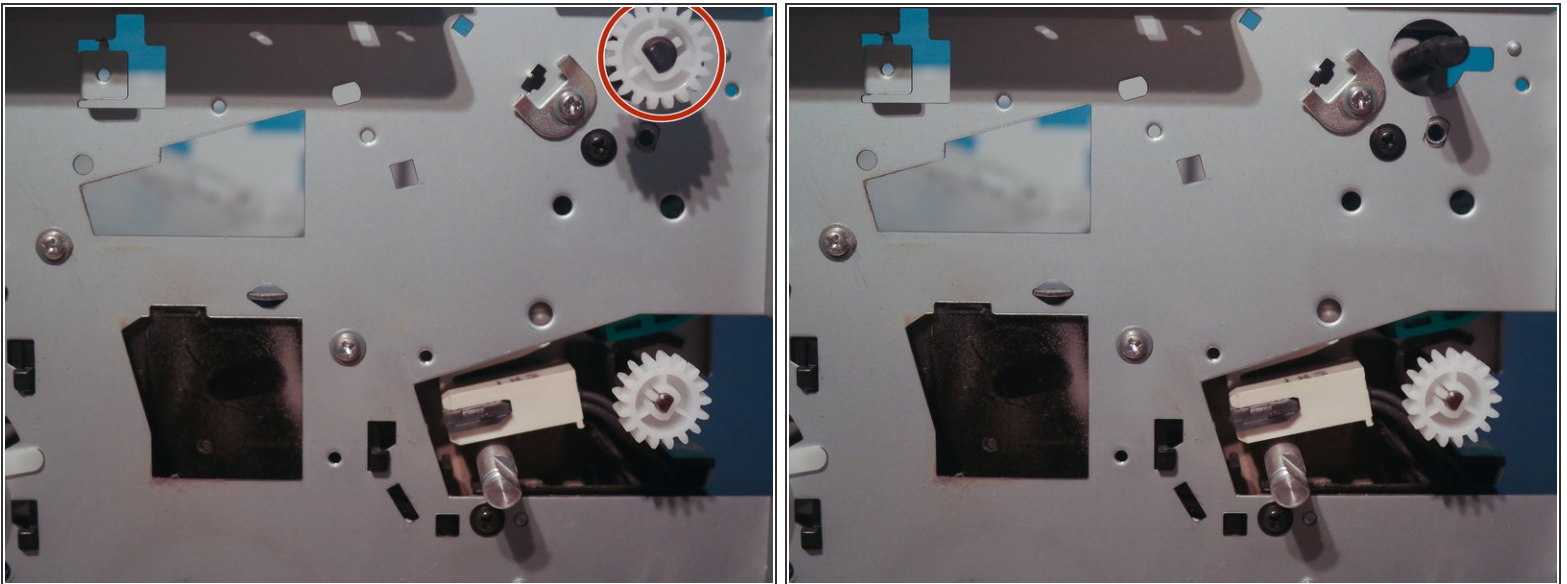


## Step 27 — Registration Assembly



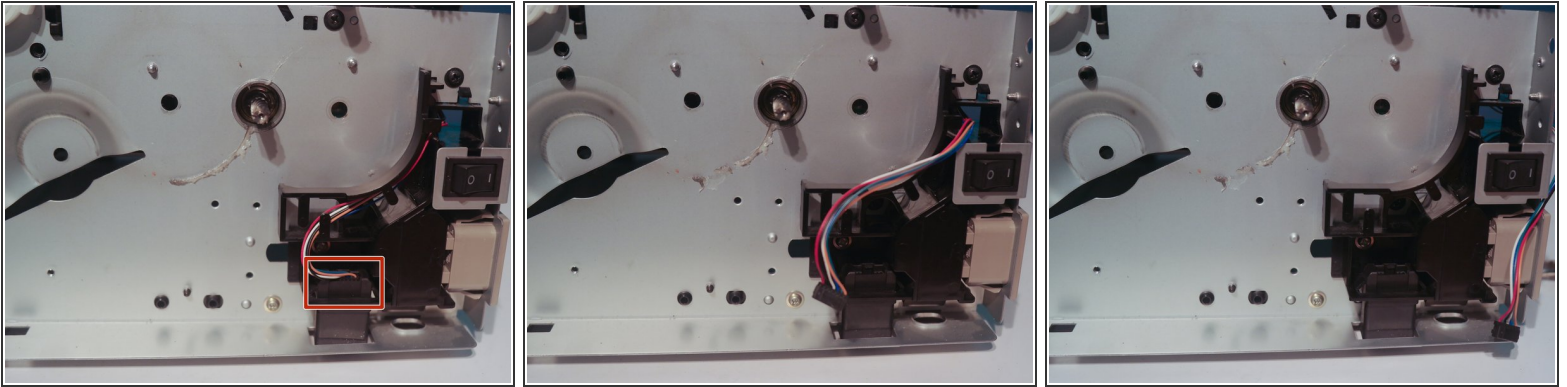
- Remove 2 screws to remove the paper feed bar.
- Remove 2 (hidden) screws to remove the registration assembly.

## Step 28 — Fuser Gears




- Remove one gear on the output shaft of the fuser.

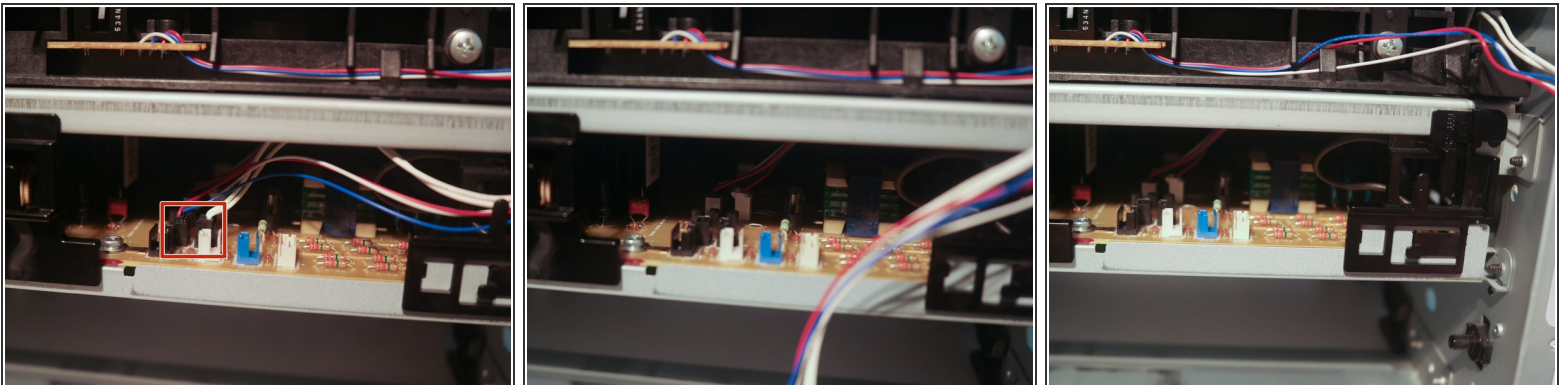
## Step 29 — Tray Connector



- Disconnect the cable to the tray connector and route it through the hole in the chassis.

 You are now halfway through the teardown.

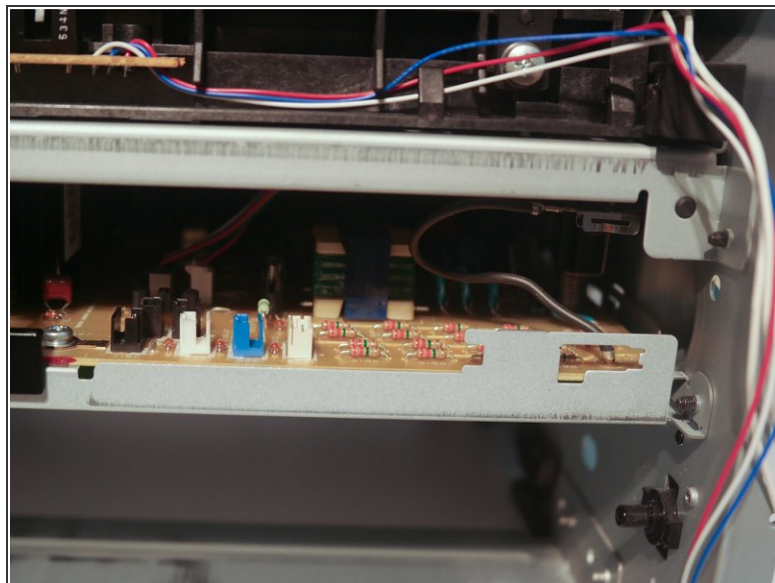
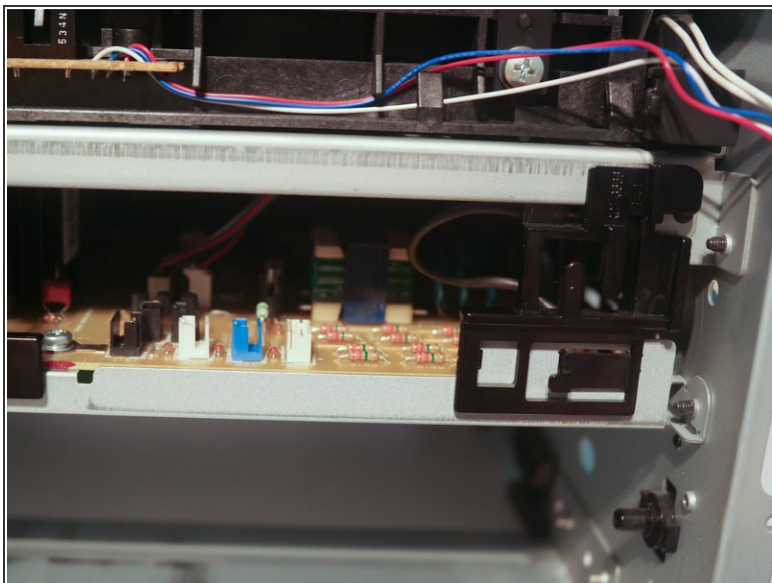
## Step 30 — Fuser Cables



- Disconnect 2 cables from the control board and remove them from the cable guide.

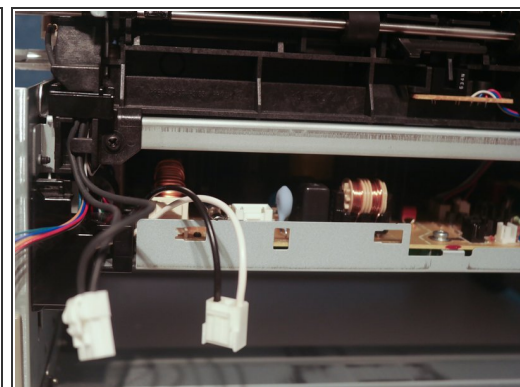
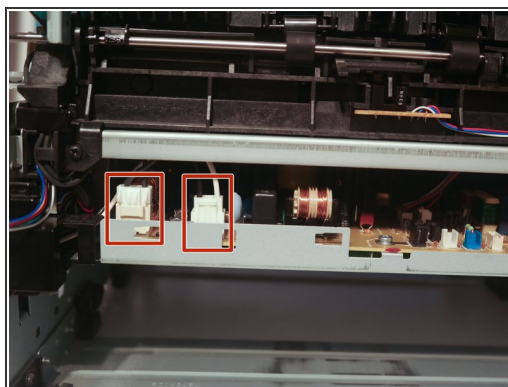
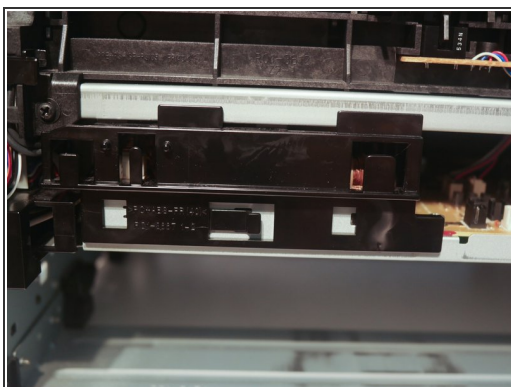


## Step 31 — Fuser Cables



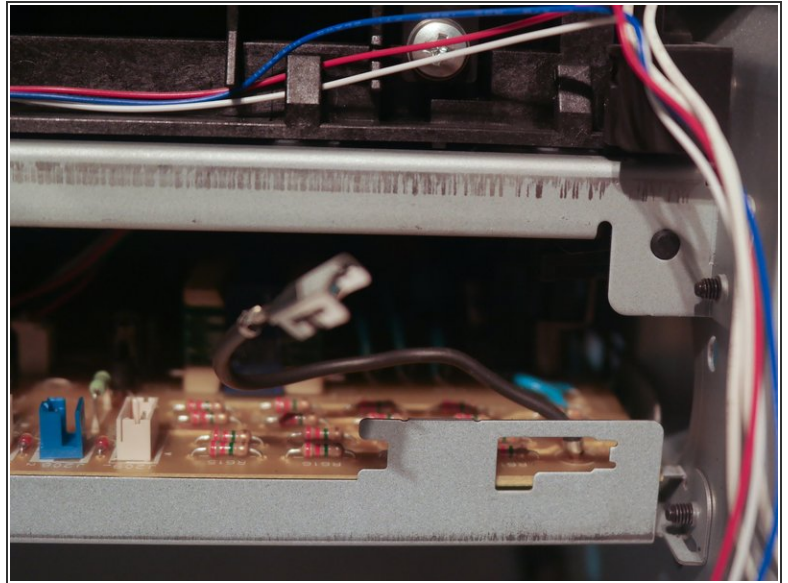
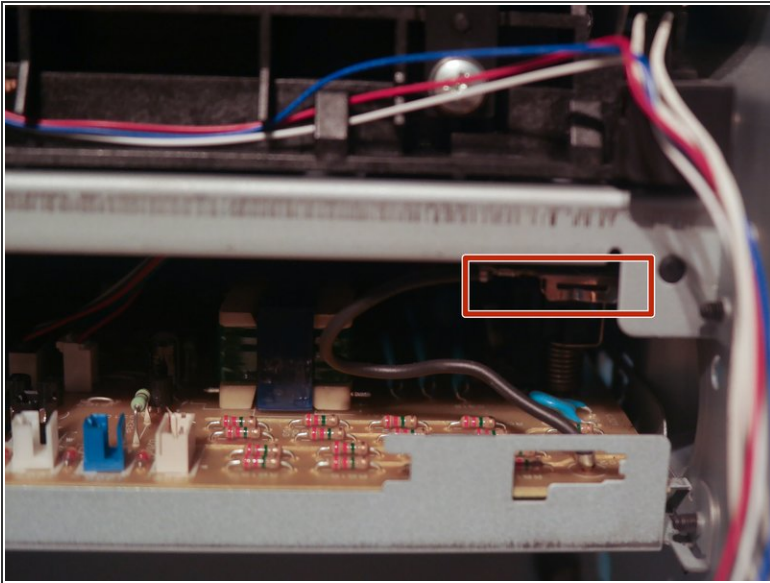
- Remove the cable guide from the chassis.

## Step 32 — Fuser Cables



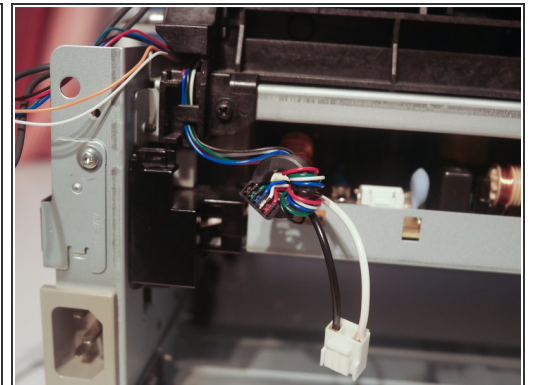
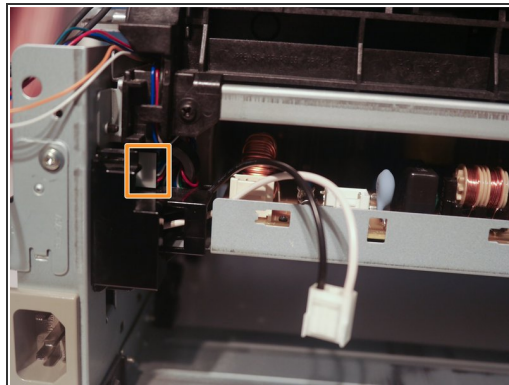
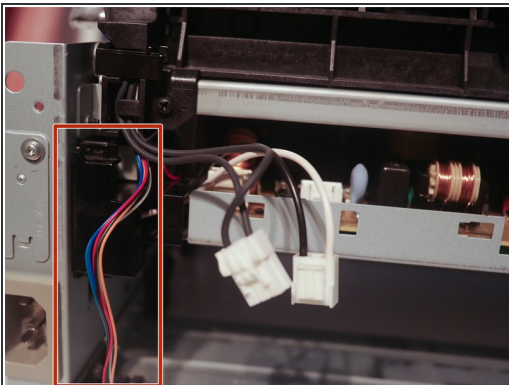
- Remove the cable guide on the other side of the chassis.
- Disconnect 2 connectors from the control board.

## Step 33 — Fuser Cables



- Disconnect the high voltage wire from the fuser.

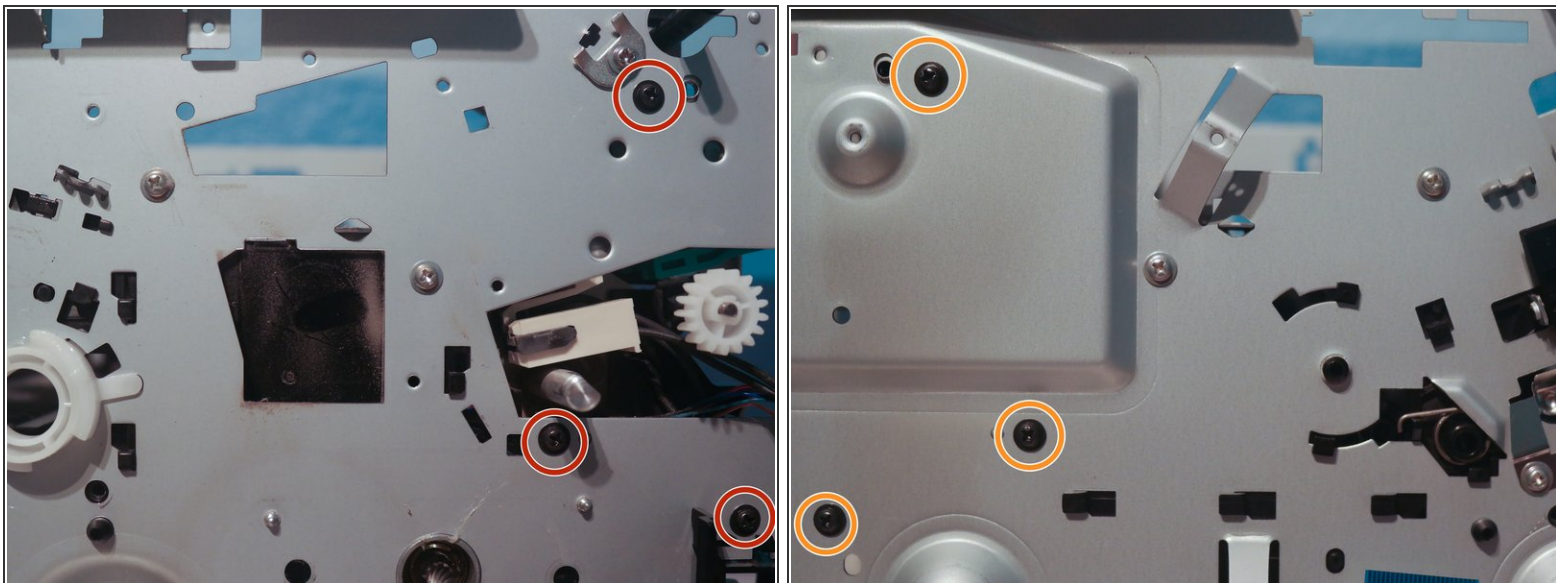
## Step 34 — Fuser Cables



- Deroute the tray connector cable through the cable guide.
- Disconnect the main motor cable.

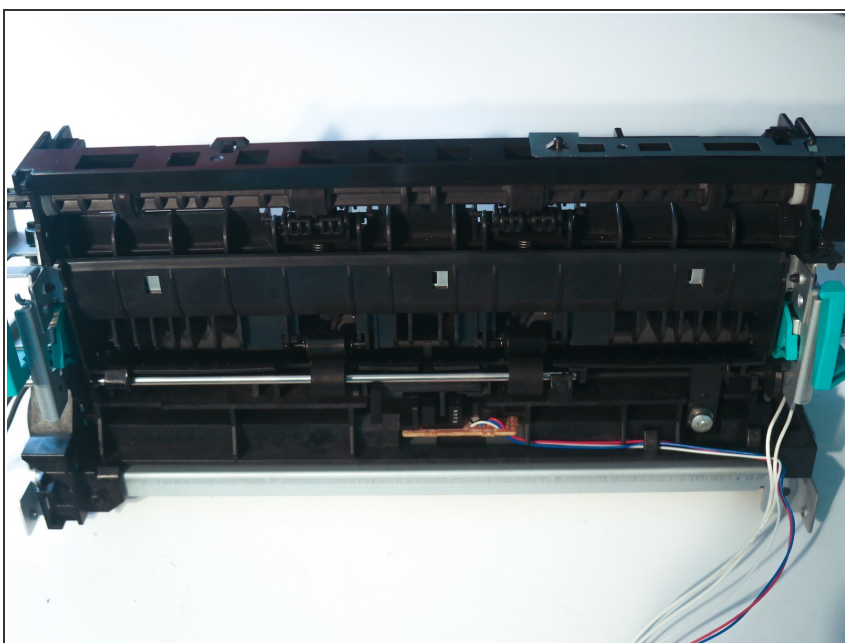


## Step 35 — Fuser



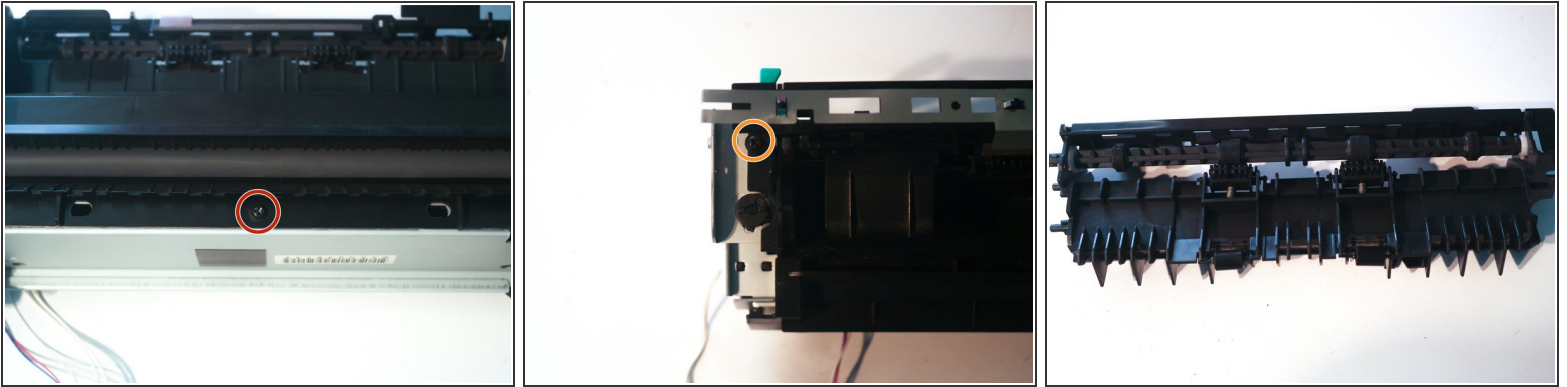
- Remove 3 screws from the right side of the printer.
- Remove 3 screws from the left side of the printer.

## Step 36



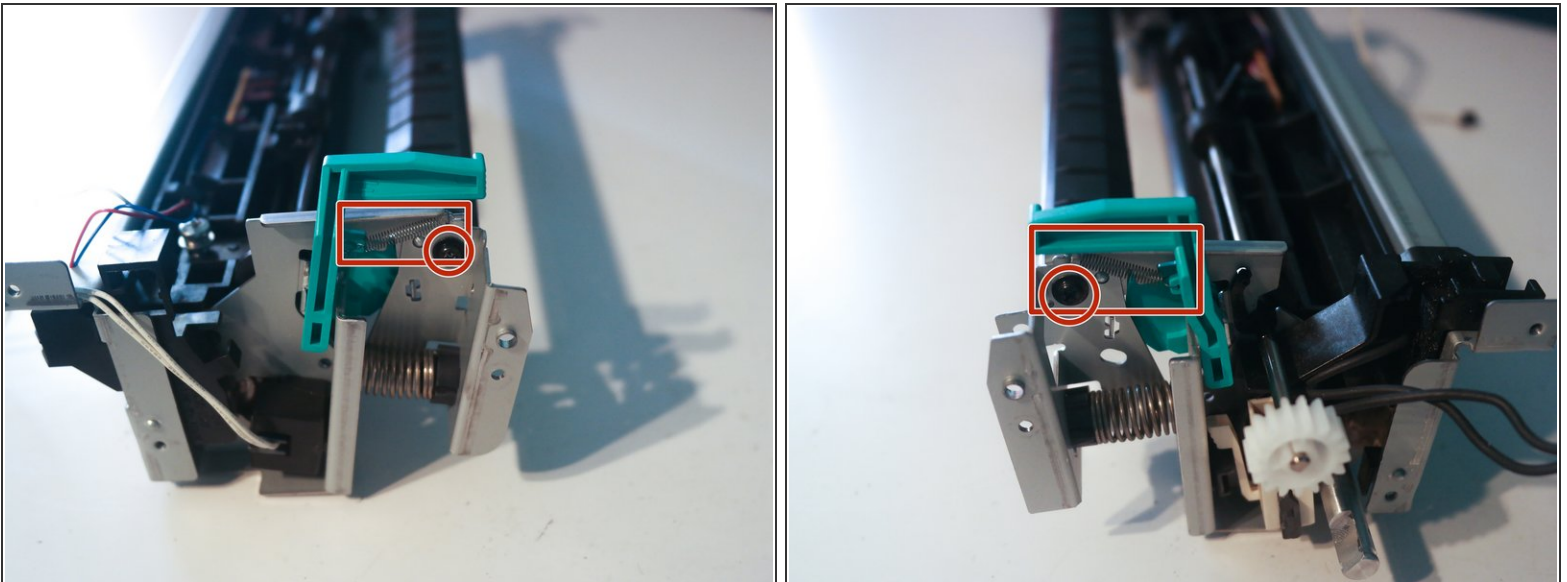
- The fuser can now be removed from the printer.

## Step 37



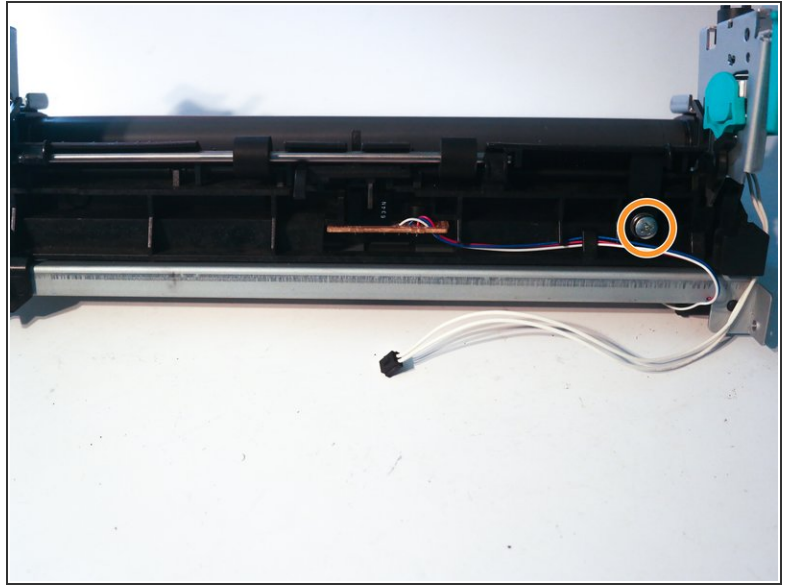
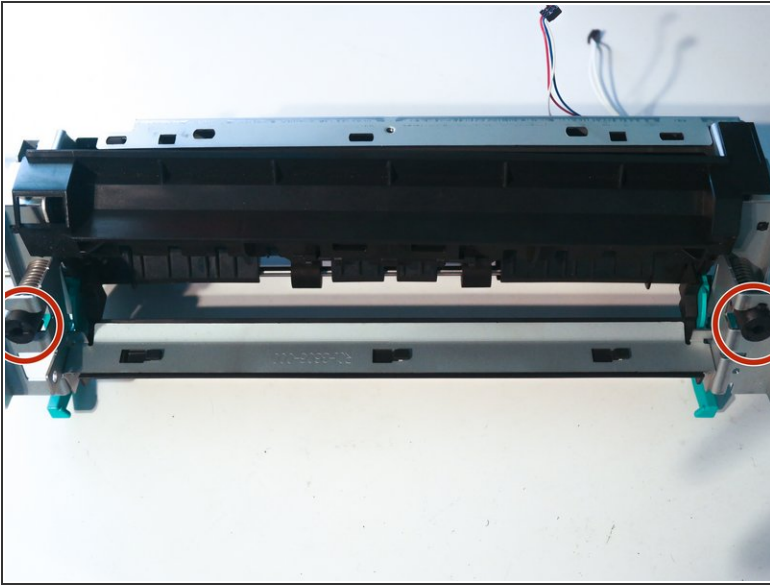
- Remove one screw on the front of the fuser.
- Remove one screw on the top of the fuser.
- The paper output assembly can now be removed.

## Step 38



- Remove one spring and one screw from each side of the fuser.

## Step 39

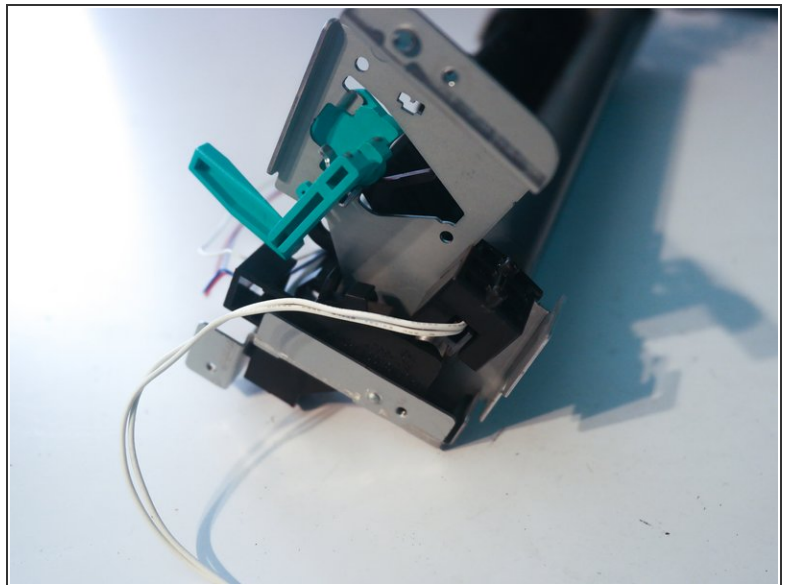
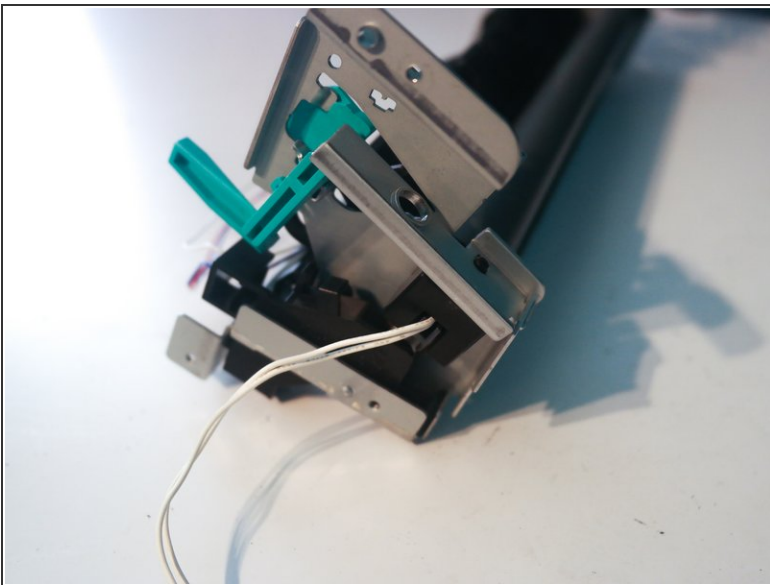


- Remove the large springs at each side of the fuser by pushing in on the plastic inserts.

⚠ The springs will fly out violently if you do not hold them with pliers.

- Remove one screw on the fuser.

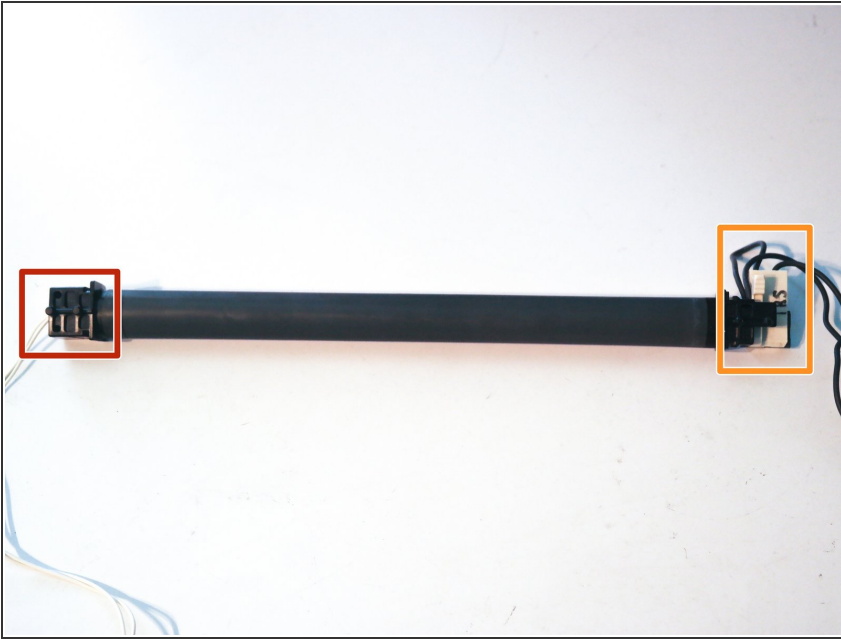
## Step 40



- Remove the metal piece held down by the spring on each side of the fuser.

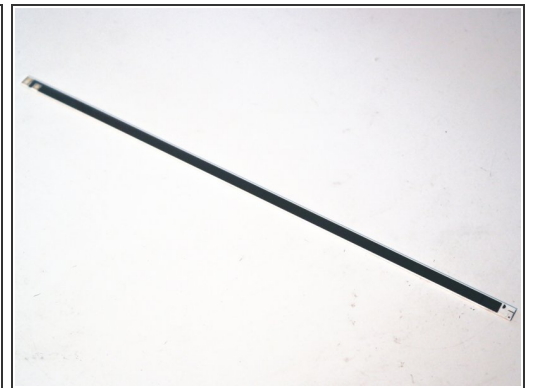
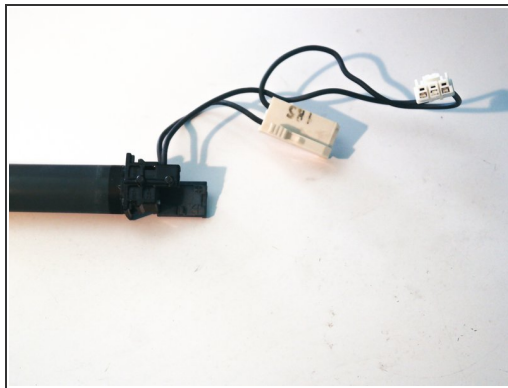
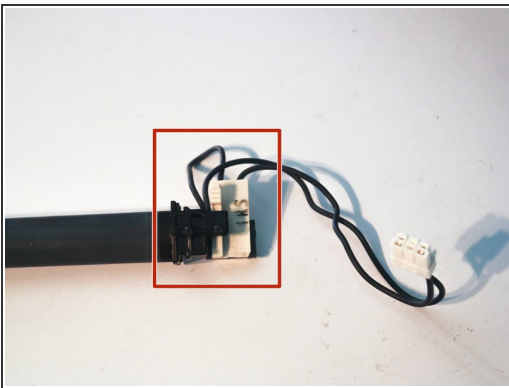


## Step 41



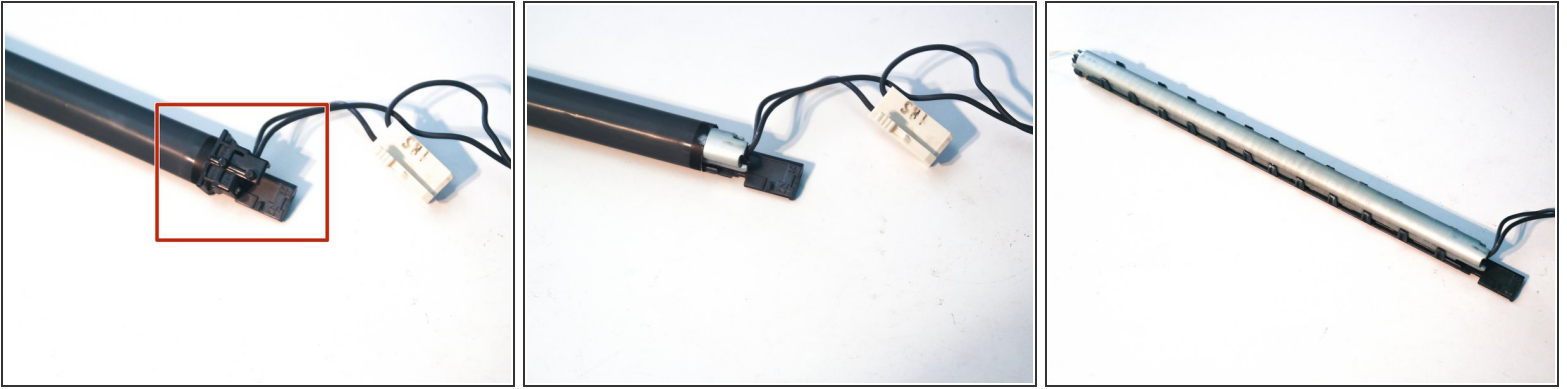
- The fuser roller can be removed from the printer.
- The white wires on the left connect to a temperature sensor.
- The large connector on the right connects to the heating element and a thermal fuse.

## Step 42



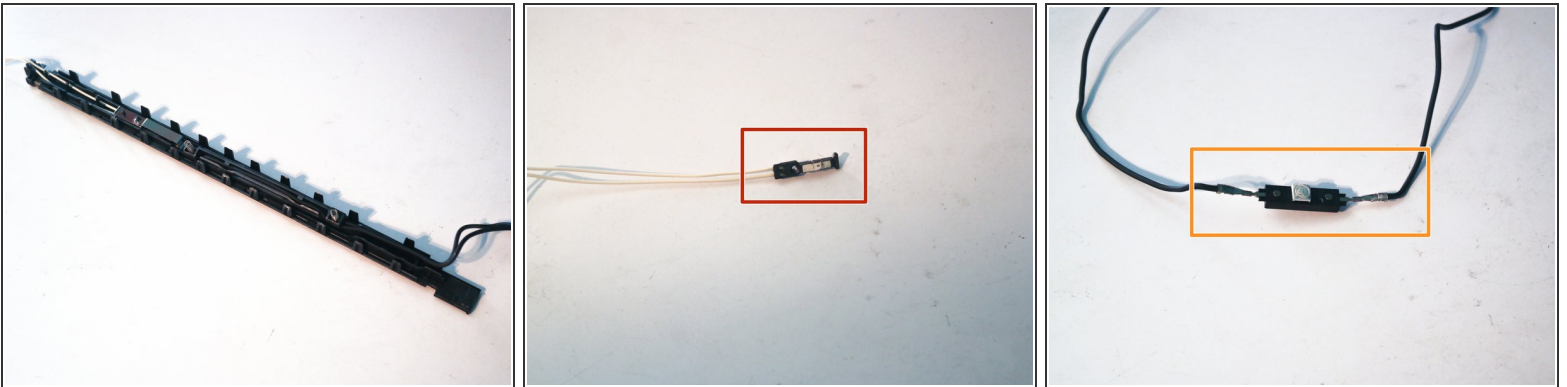
- Disconnect the snap-on connector from the right side of the fuser roller.
- The heating element can be removed from its channel in the roller.
- The heating element is a 576-watt thick film ceramic heater.

## Step 43



- Remove the plastic clip from both sides of the roller.
- The fusing film can be slid off of the roller without the clips in the way.

## Step 44



- After removing the metal cover, the temperature sensor (red) and the thermal fuse (orange) can be removed.
- The wires on both of these components have very thick silicone insulation to protect from heat.

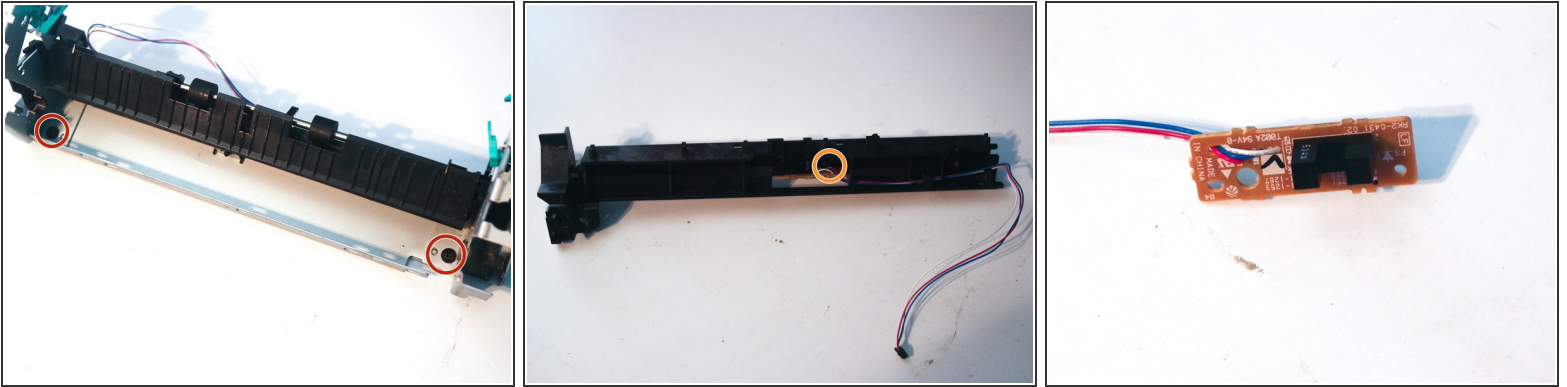
## Step 45



- After removing the plastic clip, the soft foam pressure roller can be removed.
- The metal rod in the roller allows the roller to be negatively charged, which prevents toner from sticking to the fusing film. Each end of the rod is coated in a conductive black liquid which helps it make contact with the high-voltage connector.

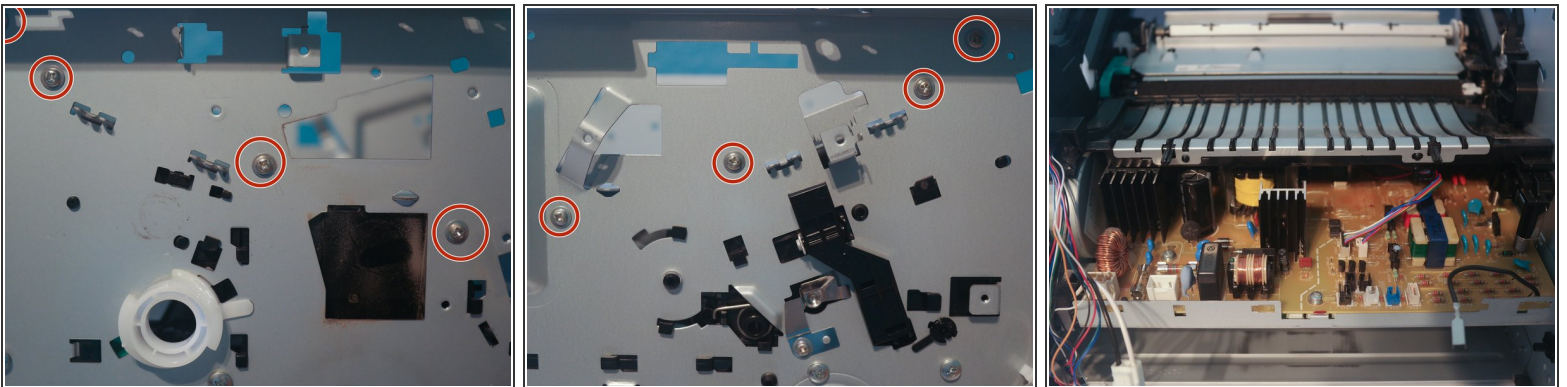


## Step 46



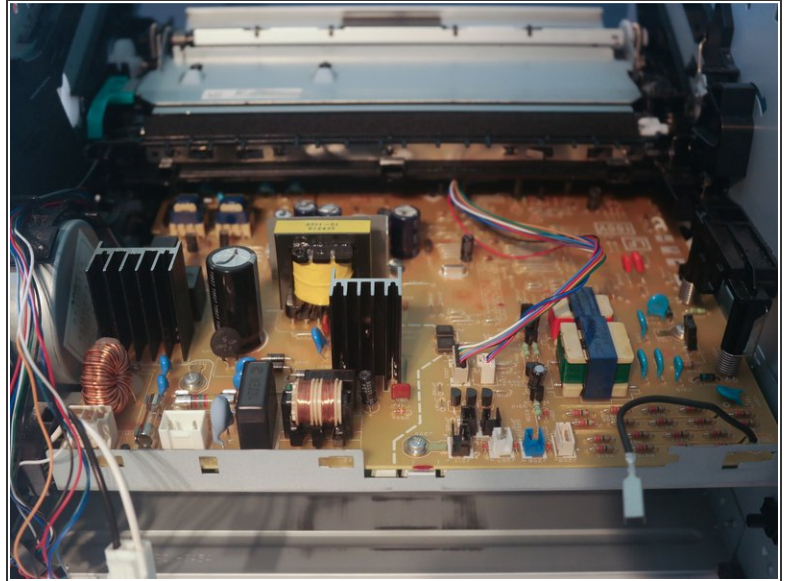
- Remove 2 screws to remove the metal bar from the fuser.
- After removing one screw, this small circuit board can be removed.
- The board contains a beam interrupt sensor, which contains an infrared LED pointing at an infrared phototransistor. When an object enters the slot and breaks the beam, the phototransistor detects it as a drop in infrared light.

## Step 47 — Midframe



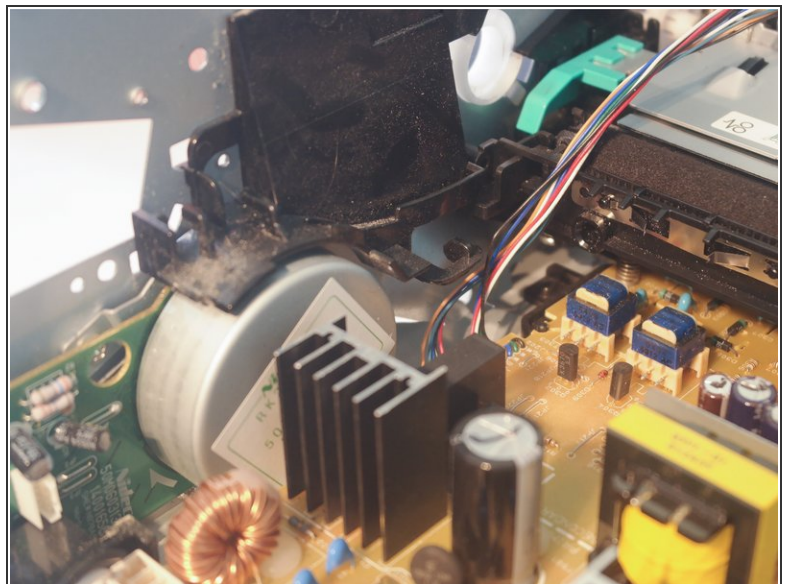
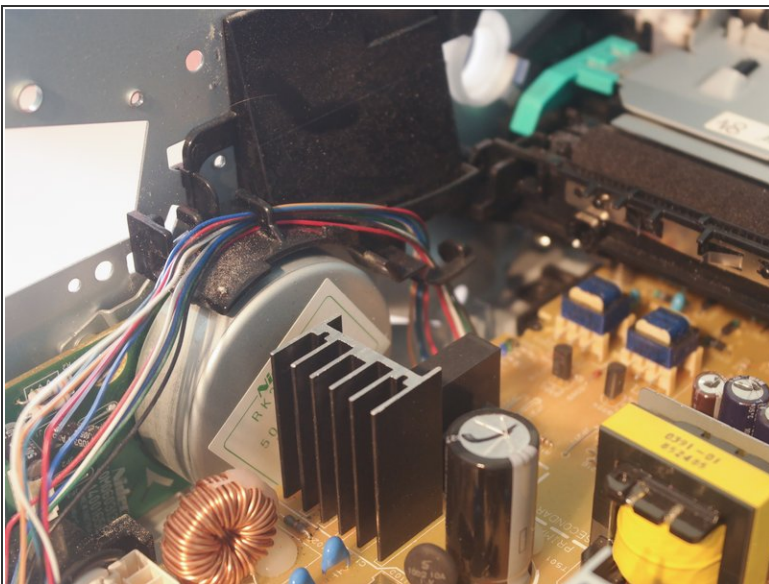
- Remove 4 screws on each side of the printer to remove the metal midframe piece that holds the chassis together.
- The massive control board can now be seen.

## Step 48 — Feed Plate



- Remove the metal feed plate from the paper feed mechanism.

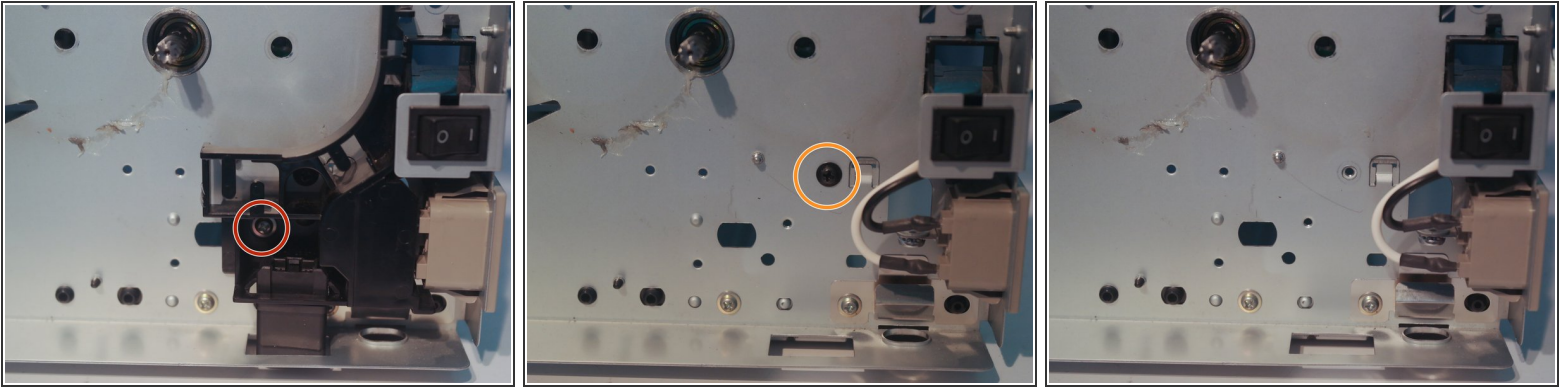
## Step 49 — Control Board Cables



- Remove the tray connector and motor cables from the cable guide.
- The high voltage corona wire used to apply a charge to the paper is visible in the right of these pictures (the spiked metal strip attached to the paper feed assembly)

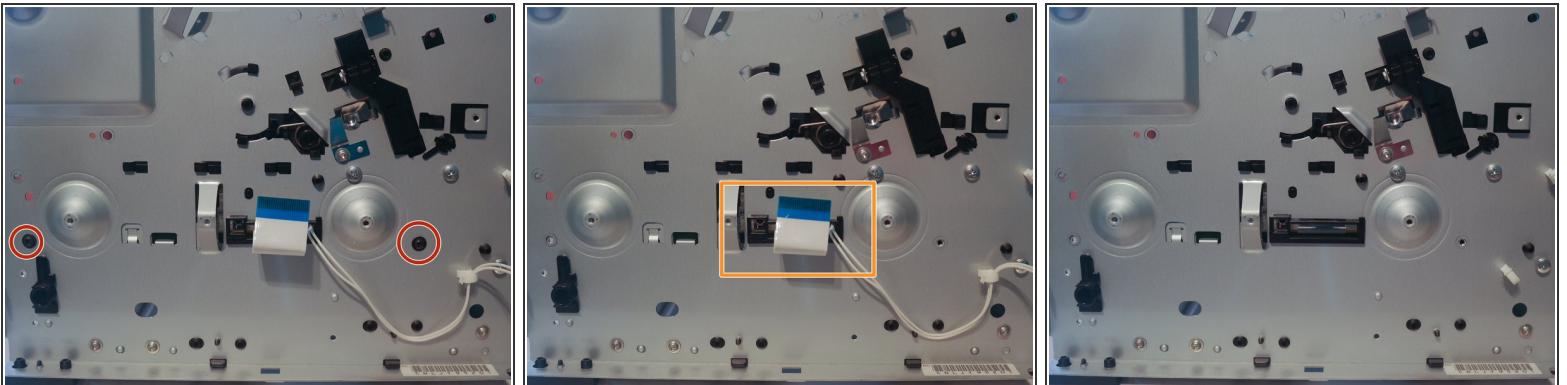


## Step 50 — Control Board



- Remove one screw holding down the tray connector cable guide and then remove the cable guide.
- Remove one screw on the printer chassis.

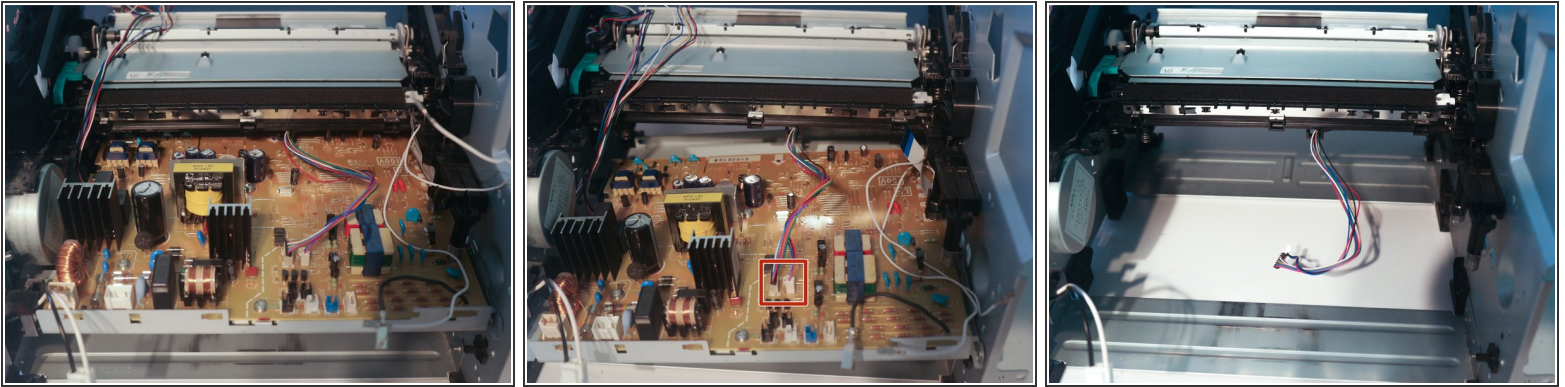
## Step 51 — Control Board



- Remove 2 screws from the left side of the chassis.
- Push the safety interlock and formatter cables through the hole in the chassis.

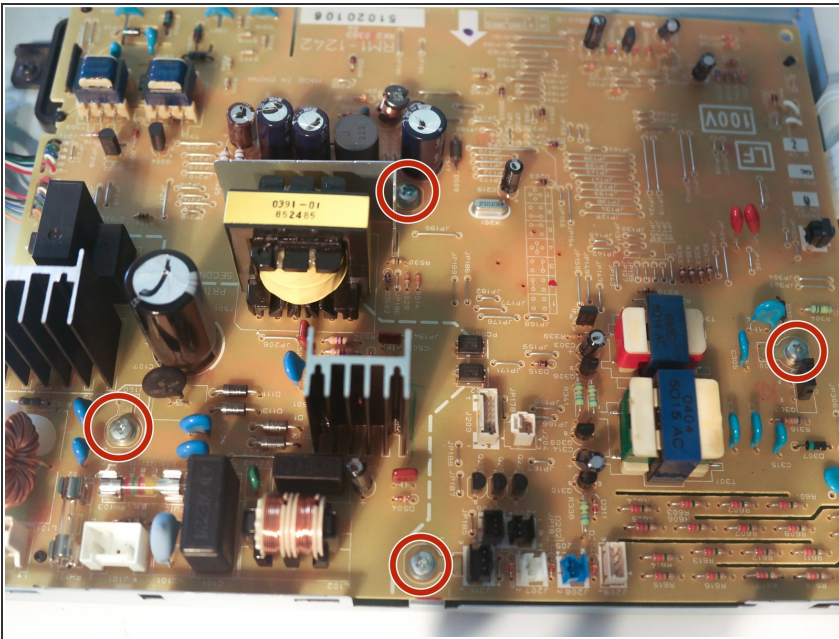


## Step 52 — Control Board



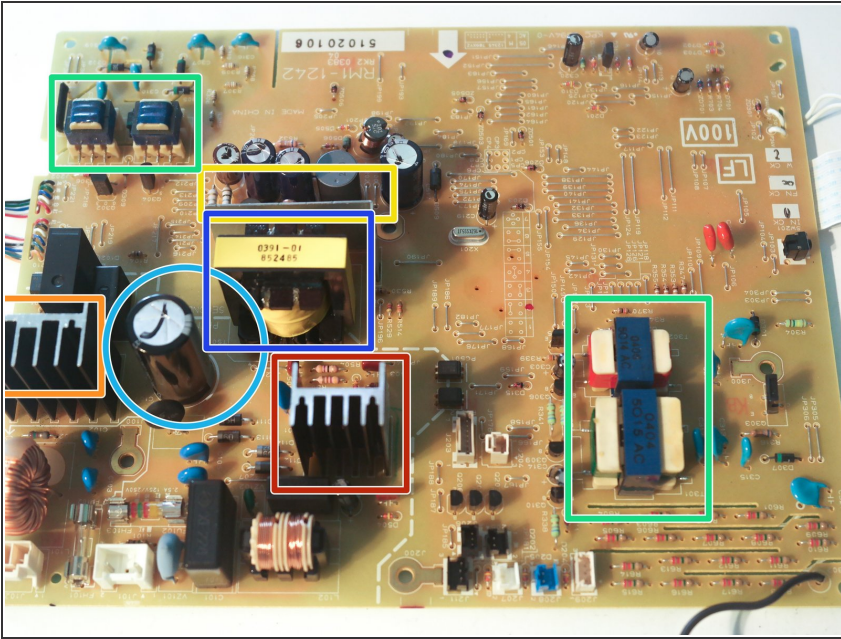
- Bend the chassis to allow the control board to come loose, and disconnect the 2 cables to the paper feed assembly to remove the control board.

## Step 53 — Control Board



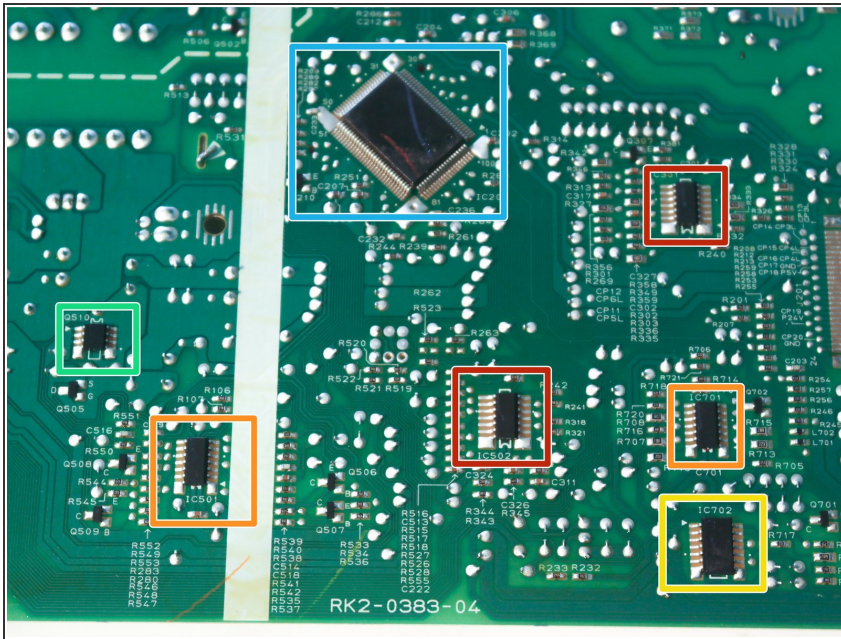
- Remove 4 screws on the control board to remove it from the metal plate.

## Step 54



- Here are the major components on the top side of the control board:
  - [2SK3561 Switching regulator MOSFET](#)
  - [CR8KM-12A Thyristor](#) (Most likely for fuser control)
  - [YG862C15R Schottky Barrier Diode](#)
  - Unidentified high-voltage transformers
  - 220uF 200V capacitor
  - Main switching transformer

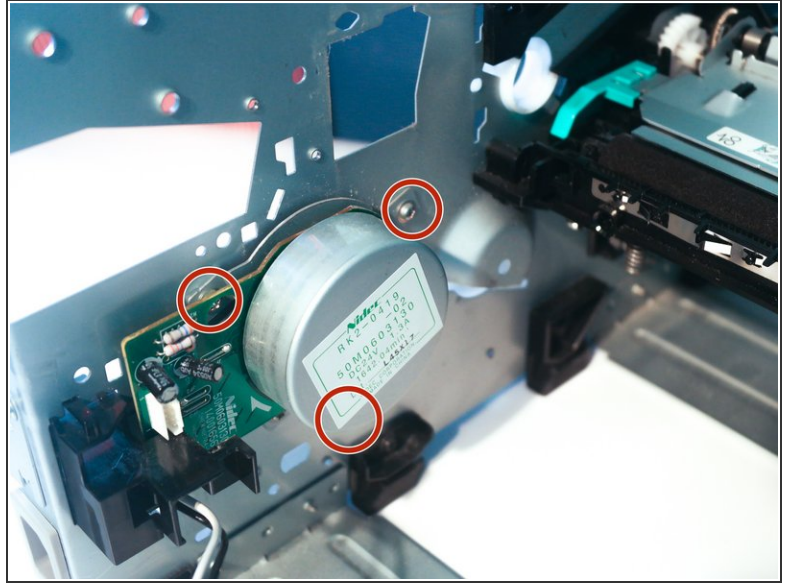
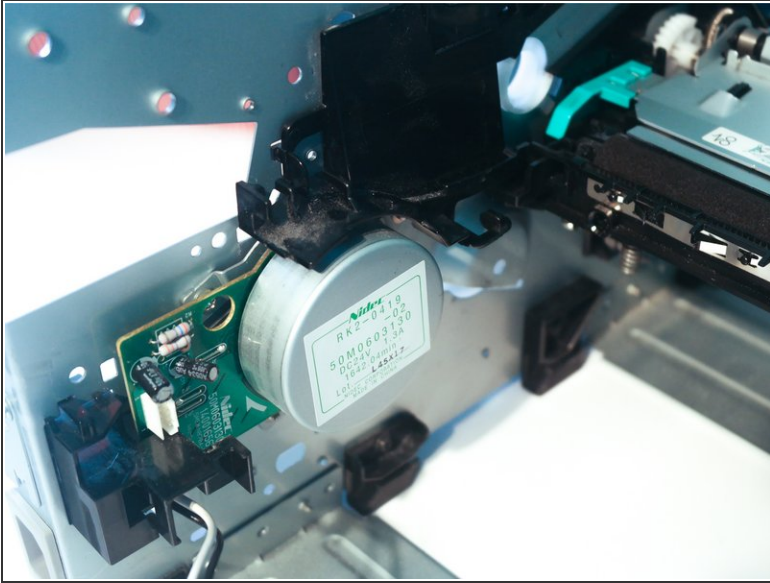
## Step 55



- Chips on the back of the board:
  - STMicroelectronics 324 E9SU518
    - Possibly an LM324 Quad Op Amp?
  - STMicroelectronics 339 E9W2513
    - Possibly an LM339 Quad Comparator?
  - Unidentified Texas Instruments chip with the part number sanded off.
  - [A2714 Power MOSFET](#)
  - Large QFP chip with the part number sanded off and a red and a blue mark on top.
- Interestingly, all the chips were covered in a clear coating that made it hard to read the part numbers.
- It appears that whoever designed this board was trying to prevent reverse engineering by making it hard to read the part numbers on the chips.

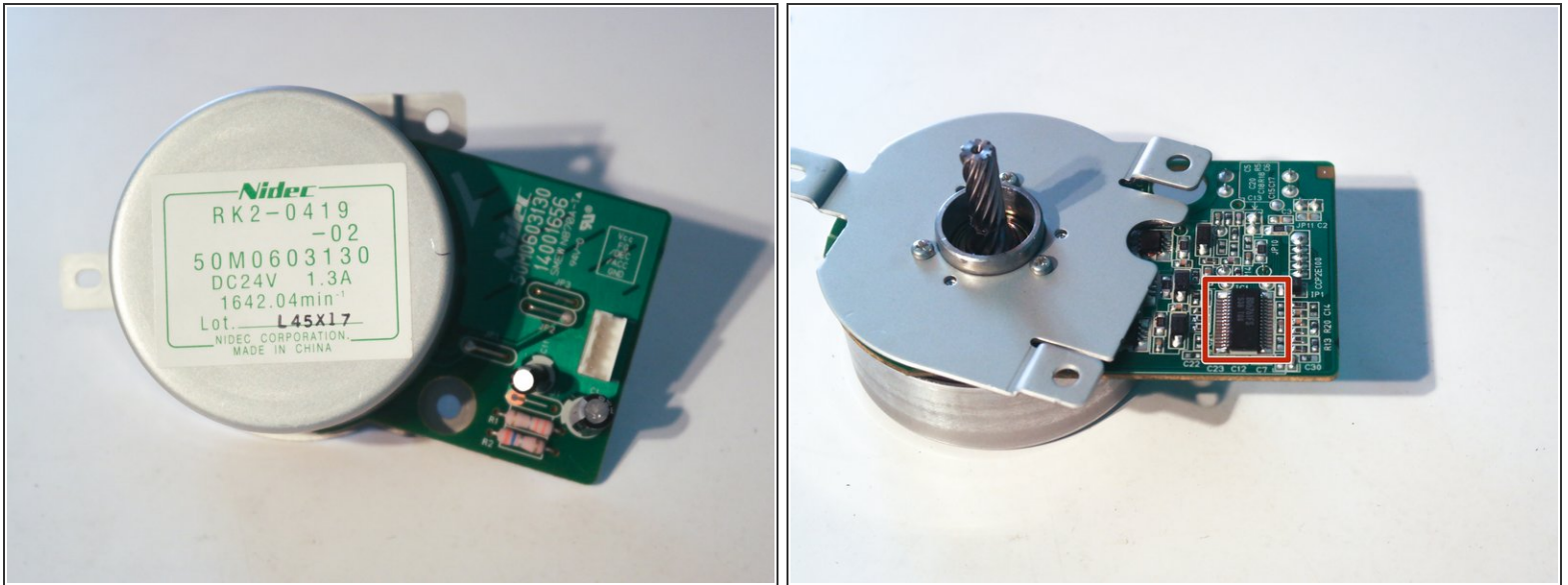


## Step 56 — Main Motor



- The main motor can be removed after unclipping the cable guide and removing 3 screws.

## Step 57



- The motor is a Nidec RK2-0419, which appears to be a fairly powerful "outrunner" style brushless motor rated for 1.3A at 24V. The rotor (the round metal part) is about 3 inches in diameter and the entire motor weighs about 15 ounces.
  - This motor might be a special motor designed for use in this printer, as it and many other components have a number with the format RK2-0xxx on them.
  - The single chip on the motor is a [BD6761FS Brushless Motor Driver](#).
- i** At this point, all that is left of the printer is the metal chassis and the paper feed assembly, a large chunk of plastic containing 2 more beam interrupt sensors.

## Step 58

# Repairability Score:



10/10

- This printer receives a perfect repairability score of 10/10.
- No adhesives, [thermoplastic staking](#), spot welding, or rivets are used.
- Service manuals for this [and most HP printers](#) are easy to find and free.
- Replacement parts are easy to find.
- Printer is designed to be repaired.