

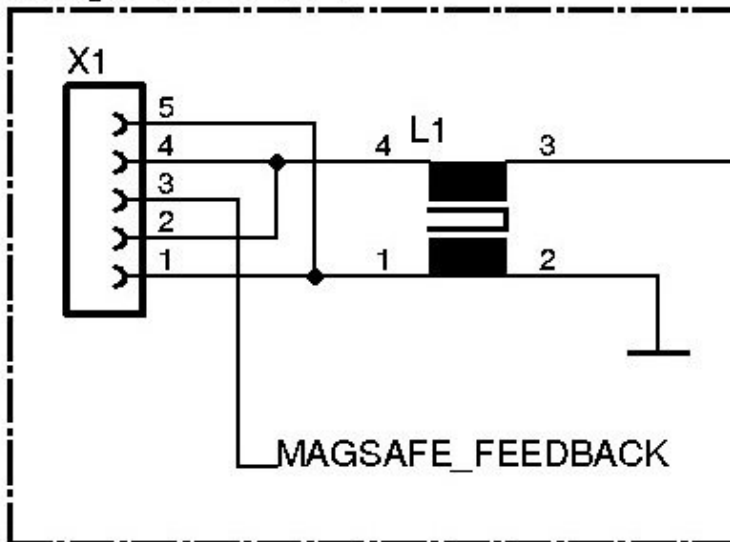


# MacBook Pro 15" Logic Board's Power Input Circuit Repair

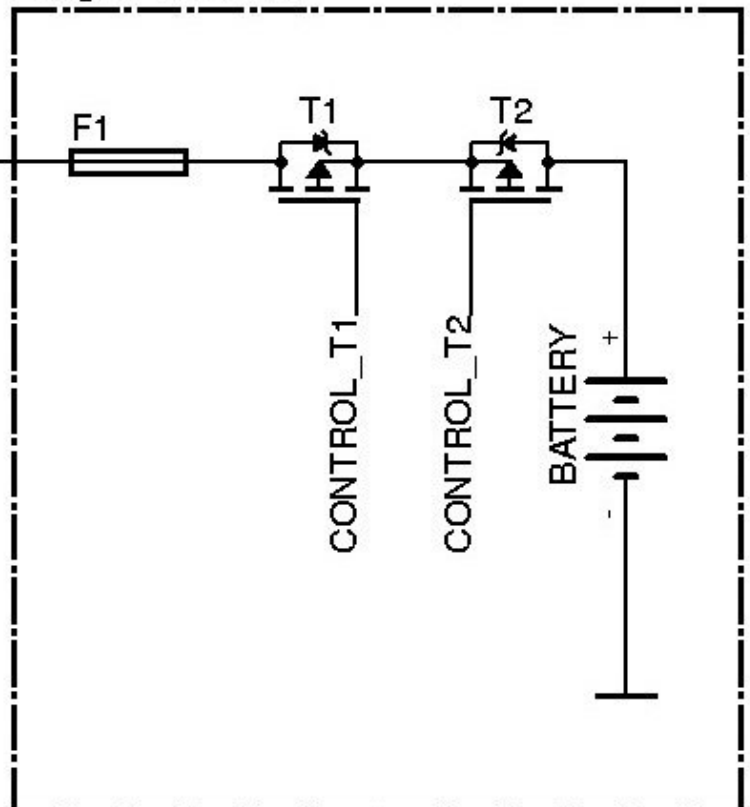
Some parts between power-connector (MagSafe) and battery can get destroyed by using a wrong power adapter. This guide will show you some basics of the supply circuit, and how to repair it.

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MagSafe PCB



Logic Board



Raw schematic of Mac Book Pro's power input circuit

## INTRODUCTION

If you use a power adapter which is too weak for your Mac Book (e.g. 60W for a MBP 15" which is specified for a 80W power adapter) the following should happen from a theoretical point of view: The power adapter is overloaded and heats up until the internal thermal protection switches it off safely. - And this happened in real life: The adapter blew up in a way, that it delivered one last powerful current pulse which also destroyed parts of the logic board. The Mac Book is still fully operational with battery, but can not be charged nor powered any more, even with a new power adapter.

The disassembling steps are referenced to [MacBook Pro 15" Unibody Mid 2010 Logic Board Replacement](#). For this particular guide it is not necessary to unmount the fans, heatpipes and speaker-microphone-block. Just skip the related steps.

Since the topology of the circuit between power connector and battery is common technique, this guide might fit to other logic boards too.



### TOOLS:

- [Desoldering Braid](#) (1)
- [Tweezers](#) (1)
- [Soldering Workstation](#) (1)
- [Lead-Free Solder](#) (1)
- [Hot Air Rework Station Hakko FR-810](#) (1)



### PARTS:

- [HAT1128R](#) (2)  
**MOSFET**  
*original part is obsolete, use an equivalent one e.g.: IRF9317*
- [Littelfuse 0469006](#) (1)  
**SMD fuse 6A**
- [MacBook Unibody \(Model No. A1278\)](#)  
[MagSafe DC-In Board](#) (1)

## Step 1 — Lower Case



- Remove the following ten screws securing the lower case to the upper case:
  - Three 13.5 mm (14.1 mm) Phillips screws.
  - Seven 3 mm Phillips screws.

★ When removing these screws, note how they come out at a slight angle. They must be reinstalled the same way.

## Step 2



- Using both hands, lift the lower case near the vent to pop it off two clips securing it to the upper case.
- Remove the lower case and set it aside.

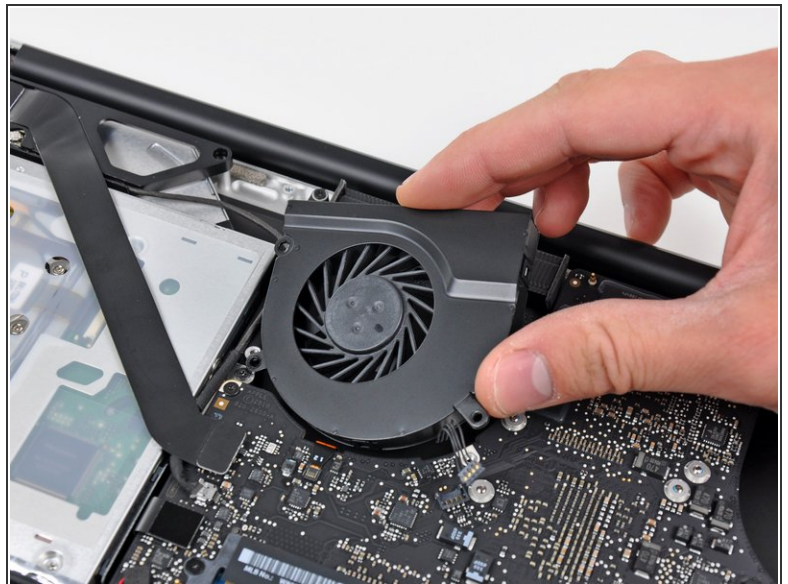
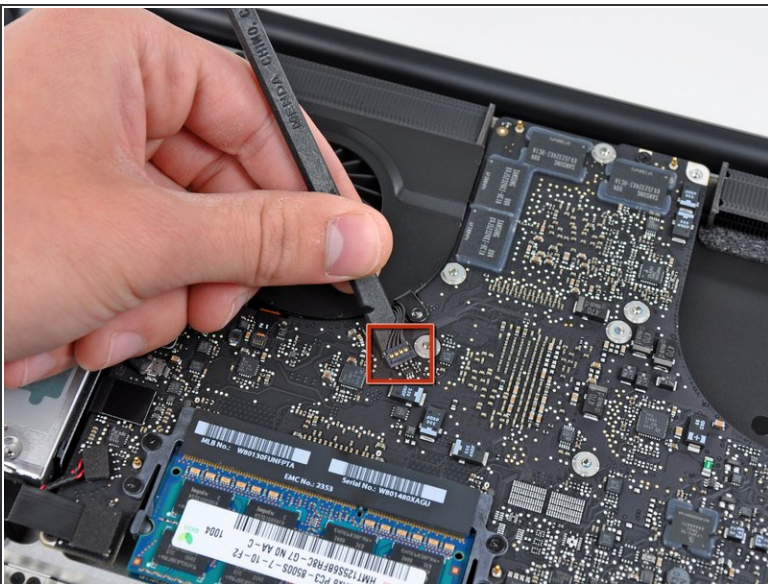


## Step 3 — Logic Board



- Remove the three T6 Torx screws securing the right fan to the upper case.

## Step 4



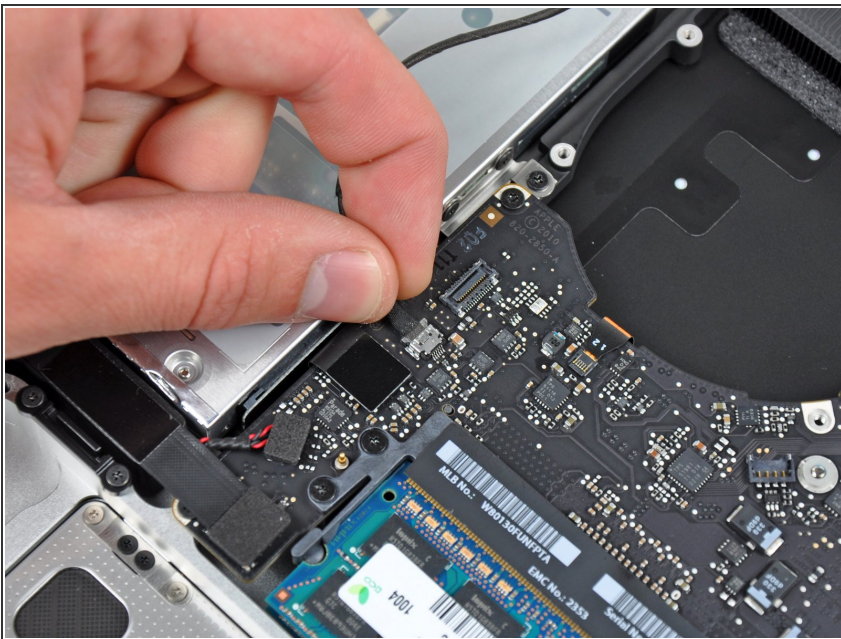
- Use the flat end of a spudger to pry the right fan connector up out of its socket on the logic board.
- ⓘ It is useful to twist the spudger axially from beneath the fan cable wires to release the connector.
- Remove the right fan from the upper case.

## Step 5



- Use the flat end of a spudger to pry the AirPort / Bluetooth ribbon cable up off its socket on the logic board.
- ❗ Fold the AirPort / Bluetooth ribbon cable back to keep it out of the way of the logic board.

## Step 6



- Disconnect the iSight cable by pulling its connector toward the optical drive opening.

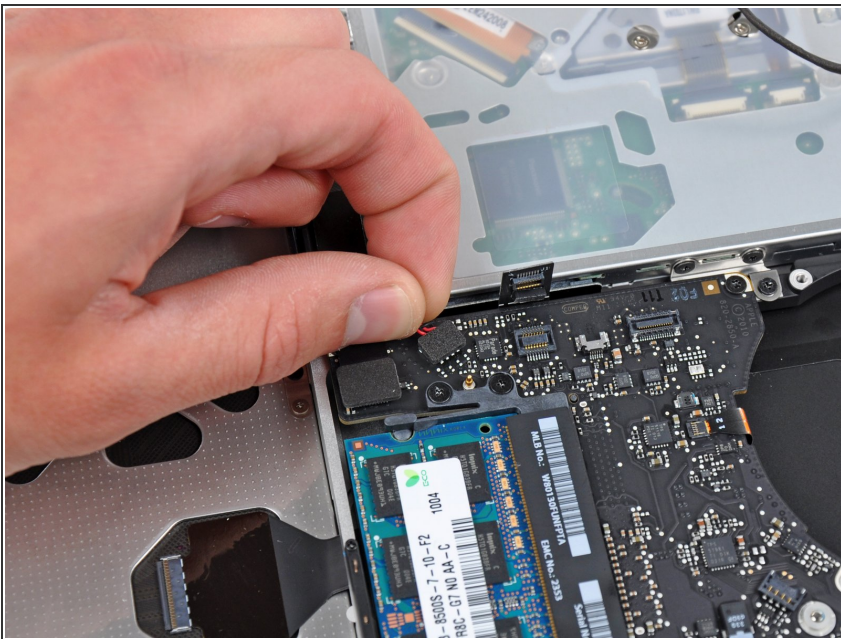


## Step 7



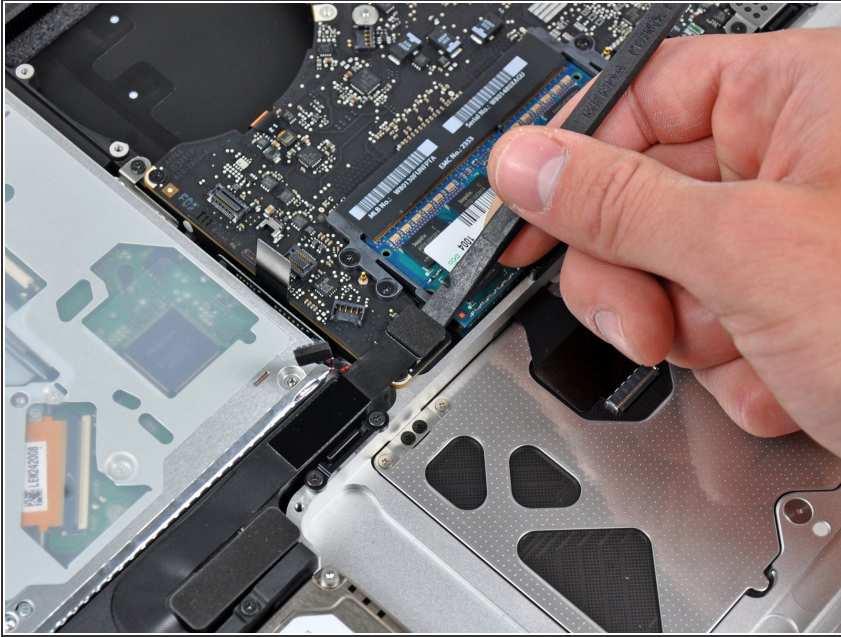
- Use the flat end of a spudger to pry the optical drive cable connector up from the logic board.
- ❗ Fold the optical drive cable back to keep it out of the way of the logic board.

## Step 8



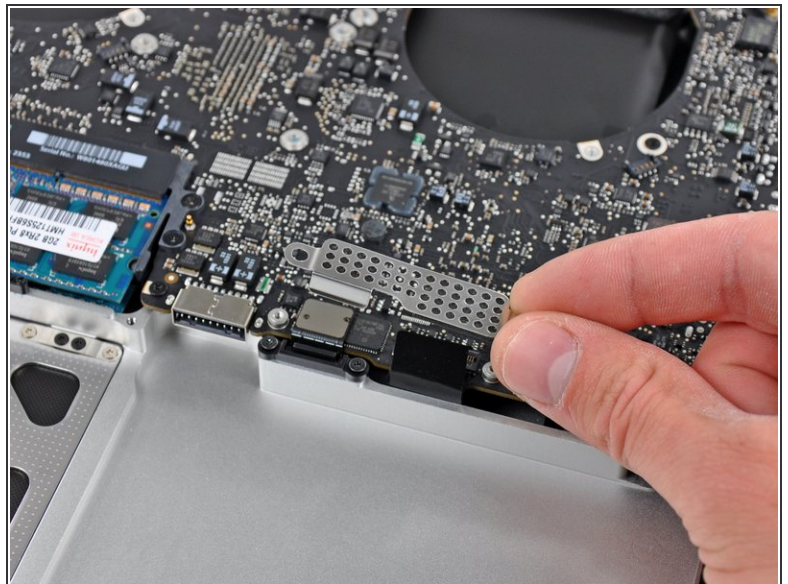
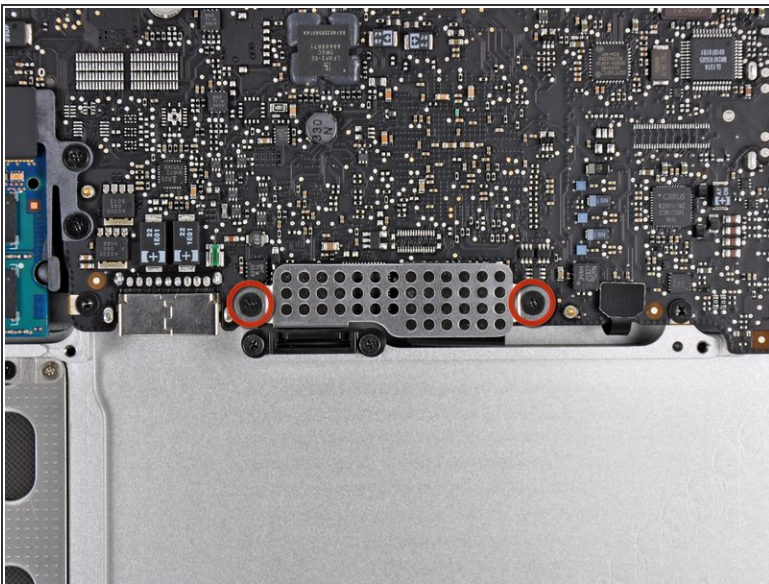
- Carefully pull the subwoofer/right speaker cable up to lift its connector out of its socket on the logic board.

## Step 9



- Use the flat end of a spudger to pry the hard drive cable connector up out of its socket on the logic board.

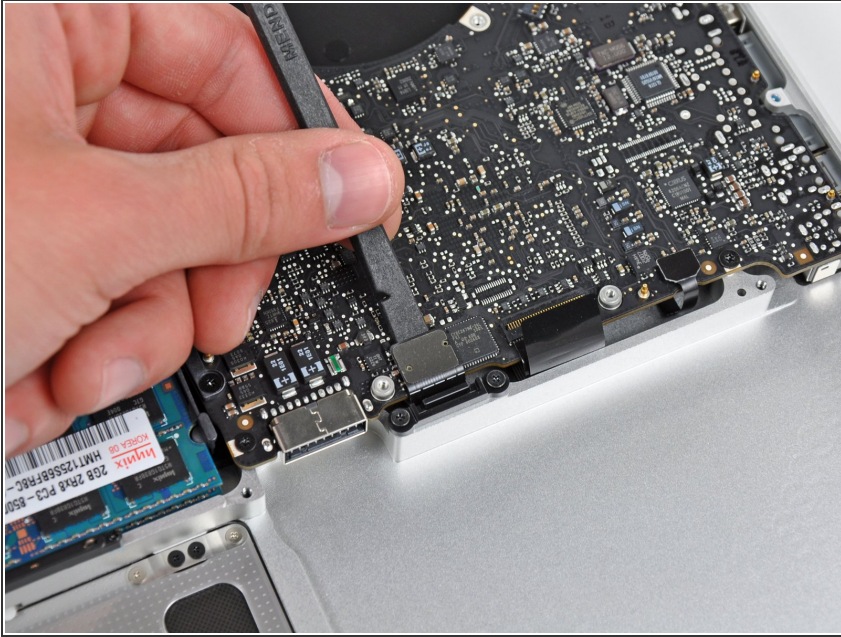
## Step 10



- Remove the two short Phillips screws securing the small EMI shield to the logic board.
- Remove the EMI shield from the logic board.

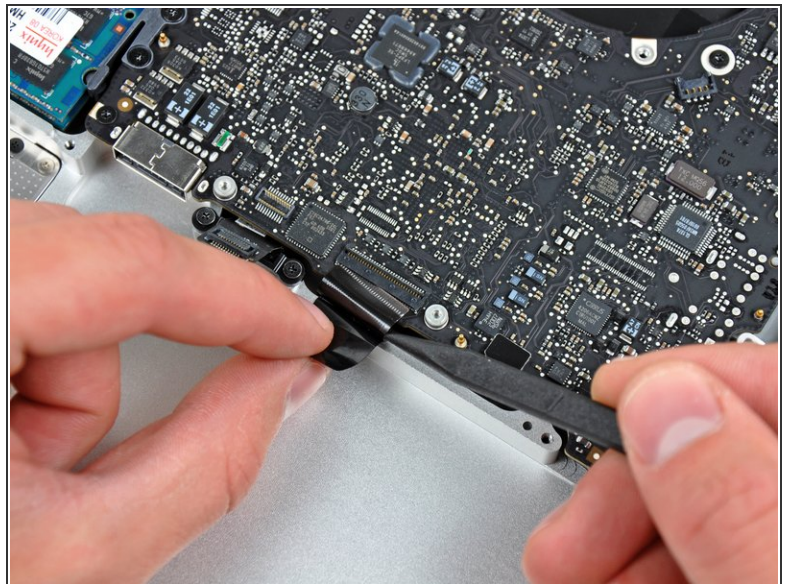
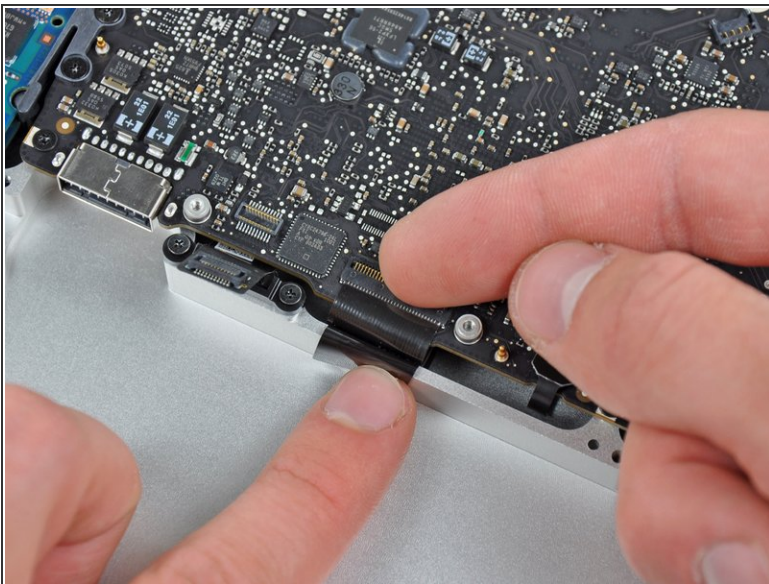


## Step 11



- Use the flat end of a spudger to pry the trackpad cable connector up out of its socket on the logic board.

## Step 12



- Use your fingernail to carefully flip up the keyboard ribbon cable retaining flap.

⚠ Make sure you are flipping up the retaining flap, **not** the socket itself.

- Use the tip of a spudger to pull the keyboard ribbon cable straight out of its socket.

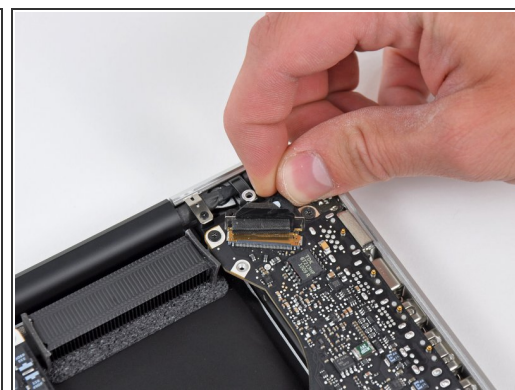
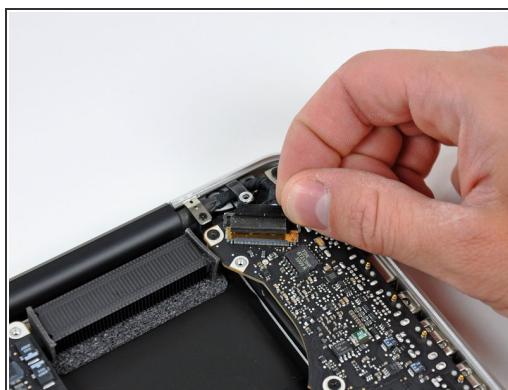
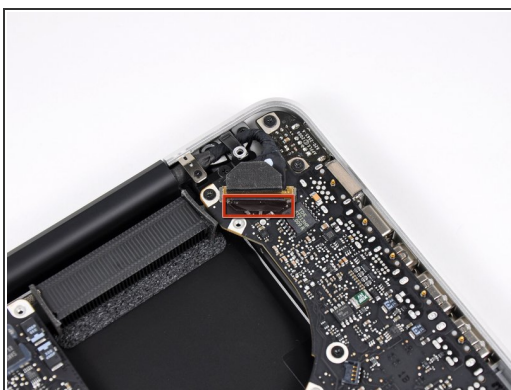


## Step 13



- Use the flat end of a spudger to pry the battery indicator cable connector up out of its socket on the logic board.

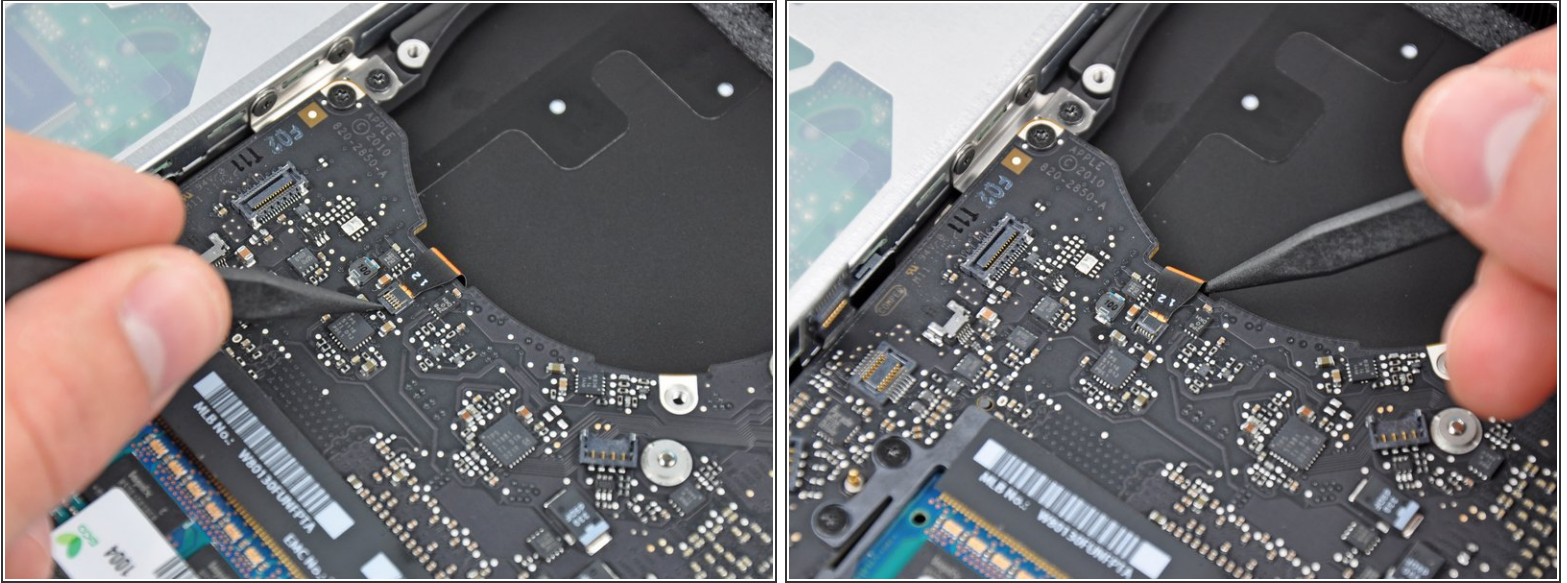
## Step 14



- Grab the plastic pull tab secured to the display data cable lock and rotate it toward the DC-In side of the computer.
- Pull the display data cable straight out of its socket.

**⚠ Do not pull the cable upward, as the socket is very fragile. Pull the cable parallel to the face of the logic board toward the corner of the upper case.**

## Step 15



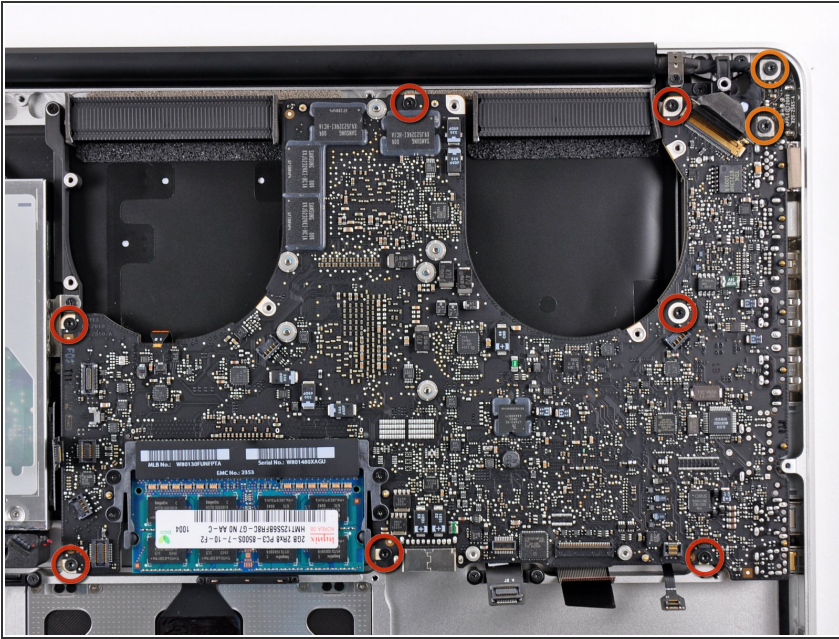
- Use the tip of a spudger or your fingernail to flip up the retaining flap on the keyboard backlight ribbon cable socket.

⚠ Be sure you are prying up on the retaining flap, **not** the socket itself.

- Pull the keyboard ribbon cable straight out of its socket.



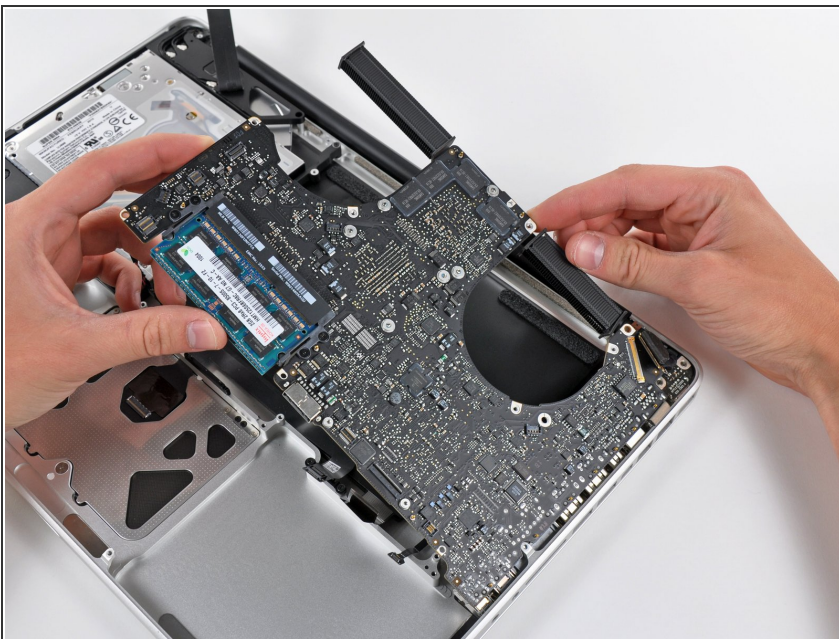
## Step 16



- Remove the following screws:
  - Seven 3.3 mm T6 Torx screws securing the logic board to the upper case.
  - Two 8 mm T6 Torx screws securing the DC-In board to the upper case.

**⚠ Do not remove the logic board yet!**  
There are components on the underside of the logic board attached to the the upper case that must first be disconnected.

## Step 17

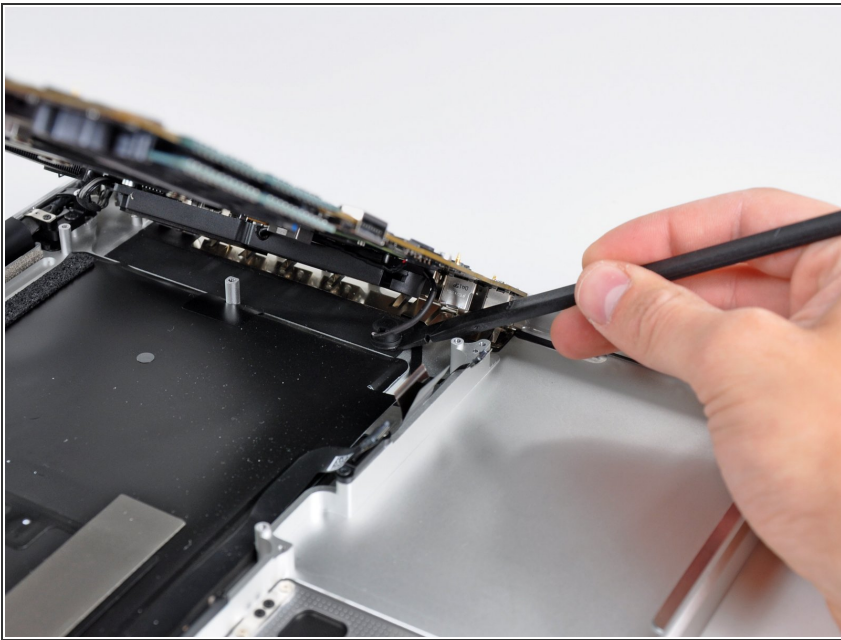


- Carefully lift the logic board assembly from the left side and work it out of the upper case, minding the

port side that may get caught during removal.

 Do not entirely remove the logic board yet!

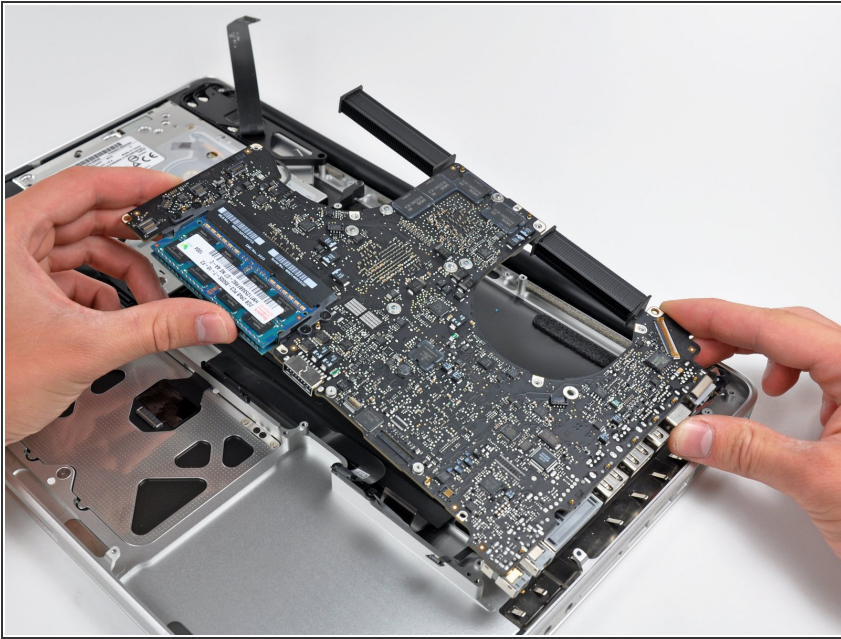
## Step 18



- Lift the logic board enough to gain clearance and use a spudger to pry the microphone up off the upper case.

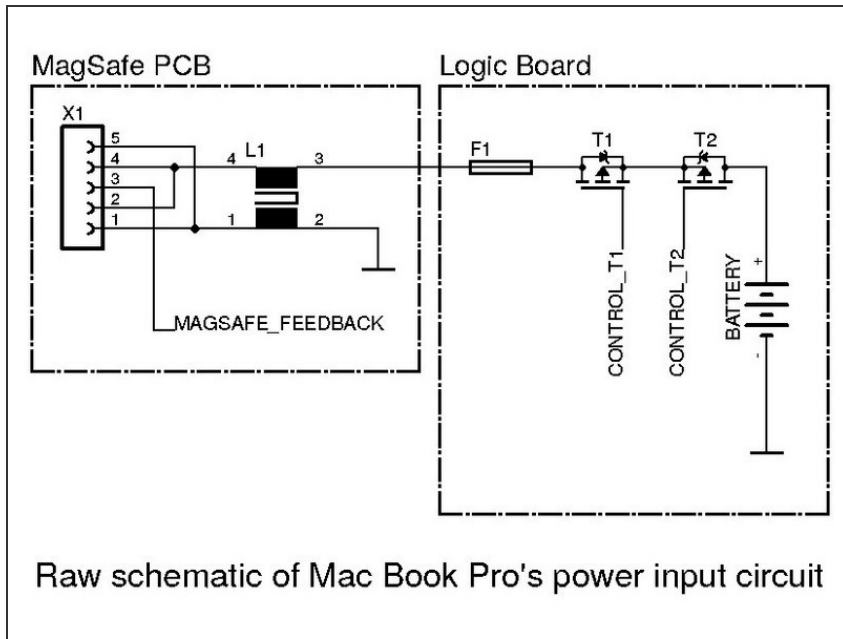


## Step 19



- Slide the logic board away from the port openings and lift the assembly out of the upper case.
- ★ Before reinstalling the logic board, it is easiest to press the microphone down into its housing in the left speaker to keep it in place.
- ⓘ To avoid ESD damage, be sure to lay your logic board on a soft, static free surface during service.

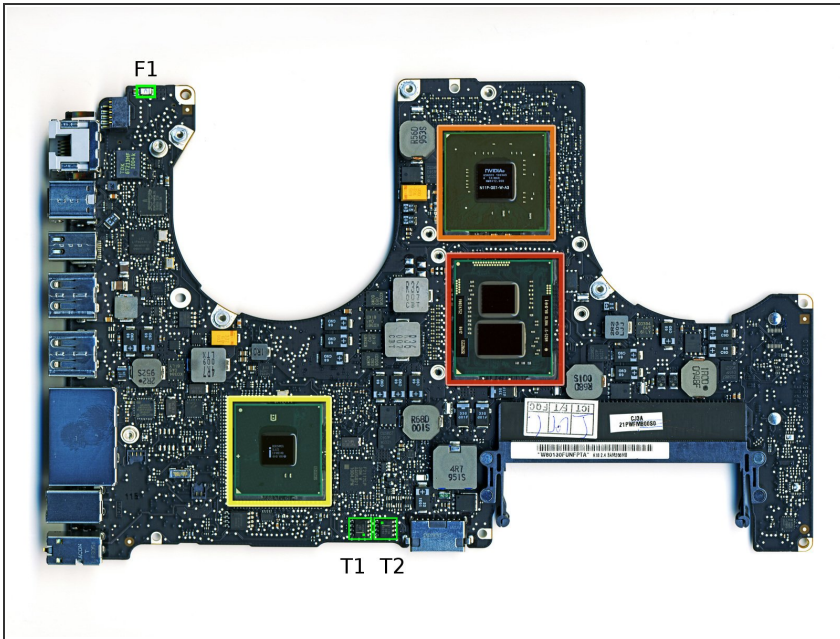
## Step 20 — The schematic



- The picture shows a schematic which is similar to Mac Book Pro's power input circuit. The series components L1, F1, T1, T2 have to draw the full power, so those are of interest for us. With an ohmmeter you can check these parts.
- L1: Since I could not figure out the manufacturer of this common mode choke I recommend to use a new MagSafe PCB.
- F1: According to the printing on this part it is very likely that this is a [Littelfuse 0469006](#) 6A fuse.
- T1, T2: Both MOSFETs are [HAT1128R](#) type. Since this part is obsolete I took [IRF9317PbF](#)



## Step 21 — Where are the parts?



- The picture shows where the relevant parts are placed on the logic board. F1, T1 and T2 are marked green. L1 is mounted on the MagSafe PCB and so not seen on the picture.
- After you have figured out which of these parts (L1, F1, T2, T2) are defective you can change them. I recommend to replace both MOSFETs if there is at least one damaged.
- After replacing the defective parts you can check the functionality by connecting the battery and the power adapter to the logic board. If everything is fine the LED of the MagSafe connector will light up green and switch to orange if battery will be charged. **Be very careful.**

To reassemble your device, follow the prerequisites guide in reverse order.