How to Disassemble the Canon EF 50mm f/1.8 II Lens

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Preface

• This instruction is intended to be helpful to those who are going to make some modifications to the camera lens to explore/reproduce coded aperture, color-filtered aperture, and other related techniques for research purposes.

• But we disclaim any responsibilities for the consequences of your following this instruction, so do it at your own risk!
  – For example,
    • The lens may get broken
    • Some parts of the lens may be lost
    • You may not be able to reassemble the lens
    • The reassembled lens may not work
    • You may get hurt
Why Canon EF 50mm f/1.8 II?

• Cheap compared to other camera lenses
  – Wouldn’t be a big blow even if you broke it by mistake
• Easy to disassemble
  – Simple structure with a small number of parts
  – Made of plastic, not metal
Preparation

• Sufficiently large working space
  – Make an open space on your desk
  – Do not work in a clutter

• Time
  – A few hours should be sufficient

• Tools
  – Cross slot (‘+’) micro-screwdriver
  – Flat metallic bar
  – Straight slot (‘−’) screwdriver can be used

• Container for detached parts
  – Small screws can be easily lost

• Cloth for wiping the lens glass
Start Disassembly

- Remove the back cover
Remove the Screws

- Two micro-screws can be found
- Remove them
Remove the Inner Cover  1/2

- Push down the metallic terminal part and drop it into the inside
  - You can make a room for it by moving the inner tube downward
Remove the Inner Cover  2/2

- Insert a bar into where the terminal part was and take off the cover
  – Caution!! See the next slide
Caution

- Be careful not to damage the cable, the board, and the lens glass
Remove the Side Cover 1/2

- You can see a seam from the outside
- Push from the inside with a bar
  - Push these two points outward
Remove the Side Cover  2/2

- The cover is glued by a piece of double-faced tape, so unglue it by force
- First push it from the inside, and then insert a bar into the widened seam from the outside

The cover has been lifted up

Double-faced tape
Remove the Clasp

• Remove the screw under the side cover
• Remove the clasp
Remove the Outer Tube 1/2

- Turn the focus adjuster ring to where the clasp was
- Then the inner tube will drop out of the outer tube
Remove the Outer Tube 2/2

- Separate the inner and outer tubes
FYI: How the AF/MF Switch Works

Manual Focus

Side cover

Inner tube

Auto Focus
Disassemble the Inner Tube 1/2

• There is a seam between the upper and lower parts
  – This seam already has a small gap
• Insert a bar into the gap and draw them apart
  – Caution!! See the next slide
Caution

• Some lugs may break when you separate the upper and lower parts of the inner tube
  – Reassembly is possible with the remaining lugs
Disassemble the Inner Tube 2/2

• It can be decomposed into three parts

- Upper part
- Lower part
- Focus adjuster ring
Disassembly Finished

- You’ve reached the aperture stop
- Put something here
  - Patterned mask (coded aperture)
  - Color filters (color-filtered aperture)

20mm
FYI: How the Aperture Stop Works

Viewed from the back
Reassembly

• Wipe dust off the internal lens glass surfaces
  – It’ll be too late after reassembly

• Rewind the process
  – Put the focus adjuster ring on the lower part of the inner tube
    • Make sure the orientation is correct
  – Put the upper part of the inner tube over it and attach them with a snap
  – Put it into the outer tube and turn the focus adjuster ring
  – Attach the clasp with the screw
  – Attach the side cover
  – Attach the metallic terminal part with the two micro screws
    • Prior to attaching the inner back cover
  – Attach the inner back cover