

Canon EOS 20D—Replacement of the Shutter Release Switch

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ABSTRACT

The shutter release switch on the Canon 20D digital SLR camera can fail completely or misbehave. In this article, we describe how to replace the switch. The required disassembly procedure is described in detail, with illustrations.

INTRODUCTION

The shutter release button on a Canon 20D digital SLR camera is a two-stage snap switch. Misbehavior of this switch has been reported (and has been experienced here). Sometimes complete failure is experienced. More subtle types of misbehavior include:

- The half-press contact closes early (starting AF and AE) during the stroke of the button before the switch has made its first snap. This is not usually a serious functional problem on its own, but may be a hint of other trouble (current or to come). (A clue to this is that the pertinent AF point indicator will flash before the first snap.)
- When beginning to complete the switch stroke from half press to full press, the half-press contact opens briefly and recloses. This makes the camera think you have fully released the button and then started over, and so AF and AE are taken again. (A clue to this is that, when you go from half to full press, the pertinent AF point indicator will flash again.) The consequences include:
 - Focusing on the wrong target (when the focus-and-recompose technique is used)
 - Delay of the actual release of the shutter

Replacing the switch is quite practical for one with moderate skills in dealing with small assemblies and electronic parts.

CAVEAT

The suggestions in this article are presented for their possible value to camera owners. Anyone who undertakes the repair of a camera pursuant to my suggestions does so at his own sole discretion and risk, and the author cannot be responsible for any misfortune in such a project or any dissatisfaction with the result.

If you are not comfortable with your skills in this type of work, please consider sending your camera to Canon Factory Service to have the switch replaced.

REQUIREMENTS

Materials

- Replacement shutter release switch. The current Canon part number of the switch is CH9-0233-000. It can be purchased from Canon Parts, which can be reached (as of 2007) at 732-521-7230. The cost (as of 2007) is about \$6.00, plus shipping.
- Fine gauge electronic solder
- Electronic grade soldering flux paste or liquid

Tools

- Phillips screwdriver, No. 00 (although the No. 000 also works well in the screws involved, and some might prefer its behavior). We like the Husky HD-74501 U changeable tip screwdriver (four Phillips tips, No. 1-000, and four straight tips, 1/16"-1/8"), sold by The Home Depot.
- Small forceps (pointed tips) for handling screws.
- Soldering iron with a small tip (conical or chisel, to your taste).
- Small dishes or the like to put removed parts in (see recommendation below regarding keeping track of the screws).
- A headband binocular magnifier (optional but nice to have).

REFERENCE

Orientation terminology

In these procedures, when we speak of *left* and *right*, we mean as seen from the photographer's position using the camera. The *front* of the camera is of course the face with the lens mount.

Overview of disassembly

To get access to the switch to replace it we need to remove the top cover of the camera. Before we can do that, we need to remove the left end cover (with the rubber flap over the various interface connectors), the front cover, and the back cover. None of these are especially difficult to do. Ribbon cables from the back and top covers

need to be disconnected from the camera. The connectors are accommodating.

Screws

In this procedure, you will remove 17 screws, of several different types and lengths, some very similar but not interchangeable. Be sure to set up some way to keep these under control and identified as to their original sites.

Each screw is given a key letter used in the disassembly and reassembly procedures for reference to the appropriate illustration.¹

Illustrations

Illustrations showing the locations of all the referenced screws and other pertinent information are attached. (They were not put inline so as to not disturb the flow of the text, and because some of them are pertinent to multiple stages of the procedure.)

Electrostatic discharge (ESD) considerations

When dealing with microelectronics-based equipment such as this camera, there is the possibility of damage to components by electrostatic discharge (ESD).

It would of course be ideal to have the camera metal frame grounded to the workbench grounding system and for the technician to wear a personal grounding strap.

If this is not convenient, exposure to this hazard can still be greatly reduced just by being careful, if you have been away from the work area, and the covers are already off the camera, to touch a metal camera frame part first when taking up the work again.

DETAILED PROCEDURE

Prepare the replacement switch

The underside of the four terminal tabs on the replacement switch should be tinned (i.e., given a thin coating of solder). It is best to first put a very thin coating of liquid or paste electronic grade soldering flux on each of the surfaces. Just the amount that can be put on with the

¹ The letters "i" and "o" are not used, our normal practice to avoid confusion with the digits "1" and "0" (although of course with lower-case letters that hazard isn't really present).

tip of a round toothpick is fine. Then use the soldering iron to wipe a very small amount of solder on the tab faces.

Initial physical preparation

- Remove the lens and put on the body cap.
- Remove the main battery.
- Remove the rubber viewfinder eyecup.
- Remove any rings or loops in the strap loops.

Remove the handgrip rubber cover

Completely remove the rubber cover over the handgrip. It is held with a layer of double-sided tape. Start to peel it at the right hand edge (at the right end of the camera), and peel it completely off. Set it aside where it won't pick up any lint.

You will probably be able to replace it during reassembly using the existing adhesive on the double-sided tape.

Remove the left end cover (interface cover)

Lift the rubber flap and remove the two screws (fig. 1: a, b). Pull the cover straight out. It is not held by any latches or overlaps, but its top and bottom may rub against the adjacent parts, so a little oomph may be needed to start it. You may want to use a thin knife blade where this cover abuts the back cover to start it.

Remove the front cover

Remove the following 5 screws:

- Two that go through the right end of the cover (this will be to your left as you look at the cover) just inboard of the grip (fig. 2:c, d). (These were under the rubber grip cover.)
- Two at the top of the cover either side of center just above the lens mount (fig. 2: e, f).
- One at the 6 o'clock position under the lens mount (fig. 3: g).

The front cover should now be free. Pull it off toward the front and set it aside. There are no electrical connections.

Remove the vision correction (“diopter”) knob

Remove the small screw from the center of the vision correction (“diopter”) knob (to the upper right of the finder eyepiece) (fig. 4: h). Pull the knob out (it should come easily). Set it and the screw aside. (This is a very special shoulder screw.)

Remove the back cover

Remove the following six screws:

- Peel back the upper-right corner of the rear rubber mat (just below the rightmost button on the rear cover) and remove the screw under it (it is in a deep well) (fig. 5: j).
- The two screws on either side of the finder eyepiece (fig. 5: k, l).
- The screw just left of the Menu button (fig. 5: m). (Be especially careful to keep this screw distinct from screws k and l. It is just a tiny bit longer, but the shorter screw will not work in this position at reassembly.)
- The two screws on the bottom of the camera very near the back edge (fig. 6: n, p).

Pull the left edge of the back cover out, opening it like a door that has hinges on your right. Be careful as there is a ribbon cable running from the right end of the door to a connector on a circuit board in the camera “body”. Open the door almost 180°.

Disconnect the ribbon cable from the connector. (See fig: 7). First, lift the small black bar running across the connector (a fingernail is probably the best tool). This unclamps the cable. The cable should then pull out very easily. Set the back cover aside.

Do not be tempted to leave the cover cable plugged in as you do the rest of the work. There would be great risk of damaging the ribbon cable as the camera is handled.

Remove the top cover

Unplug the rightmost (wider) of the two ribbon cables running down from the right end of the top into clamp-type connectors on the circuit board. (See fig. 8.) Lift the black strip on the connector and pull the tip of the cable out. Then do the same with the narrower ribbon cable.

Remove the following three screws:

- (Set the camera upside down.) The screw in a little pocket at the center top of the front face of the grip, heading upwards (fig. 3: q).
- (Set the camera rightside up.) The screw seen at the bottom of the "well" from which arises the right-hand strap loop (immediately inboard of the loop) (fig. 9: r).
- (Set the camera upside down.) The screw at the top (bottom now) of the interface compartment at the left end of the camera; it passes through the left strap loop (fig. 10: s).

Set the camera rightside up. Lift the top cover straight up and off. Be careful as there are still four wires connected to it (not unpluggable). Just set the cover in a handy place. (See fig. 11.) Note that the two of these wires are connected to the storage capacitor for the onboard flash. Be careful as it is possible that this may still be charged, and to a rather high voltage. Don't touch the leads at either end. (There is little likelihood of accidental contact.)

Replacing the switch

The existing switch must first be removed from its little rectangular "flag" on the ribbon cable. It is surface mounted, with four small horizontal tabs soldered to pads on the top face of the flag. (See fig. 12.) It is probably best to do this with the flag in place, but you might prefer to carefully lift it up off its supporting pedestal and work the next step "in midair". Two holes on the flag go over tapered locating posts on the pedestal, but there are no screws or anything holding it down (the switch is normally held in place by the bottom of the shutter release button well in the top cover).

Take a thin probe (a flat jeweler's screwdriver is good, or a long dressmaker's pin) and place it between the switch and the flag adjacent to one of the terminal tabs. Put a little inward pressure on the probe.

Heat the tab with the soldering iron. As the solder melts, the probe will advance, lifting the switch and holding down that part of the flag, allowing the tab to separate from the flag.

Do the same for each of the other three terminal tabs. The old switch will now be free, and should be set aside.

Remove most of the residual solder from the pads to which the tabs were connected. Unsoldering wick is good for this, or a vacuum solder

sucker can be used. If the excess solder isn't removed, it will not be possible to put the new switch into the proper position.

Place the new switch into position. The two little posts on its bottom should be fit into the two holes in the flag. The holes and posts are off-center so the switch can only be put in place (reasonably) in the proper orientation.

Touch each terminal tab (four altogether) with the soldering iron tip until the solder melts. You should not need to add any solder while doing this. Hold the corresponding corner of the switch down with a small screwdriver or other suitable probe while the tab is being soldered. Hold the pressure for a few seconds after removing the soldering iron tip.

Inspect each joint with a magnifier to be sure that proper solder wetting and flow have occurred.

REASSEMBLY

Reassembly is basically just the reverse of disassembly.

Put the top cover into place, and replace the three screws q, r, and s (figs. 2, 9, and 10).

Take the narrower of the two ribbon cables from the top cover and insert its tip into its connector on the circuit board. (See fig. 7.) Be sure the black locking bar is lifted first. The tip should slide in freely. When the tip of the cable is fully in place, press the black locking bar down with your finger to lock the cable into the connector. Then do the same thing with the wider ribbon cable.

Take the back cover to hand and insert the tip of its ribbon cable into its connector on the circuit board. (See fig. 8.) Again, press down the black locking bar to lock the cable in place.

Fold the back cover into place and replace the screw just left of the Menu button (fig 9: m) to keep it steady. Then replace the two screws on the bottom of the camera (fig. 6: n, p). Replace the two screws on either side of the viewfinder eyepiece (fig. 5: k, l). Lift the upper right corner of the rubber mat and replace the screw under it (it goes into a deep well) (fig. 5: j).

Replace the vision correction knob. It has a tapered end key that goes into a tapered slot on the end of the mechanism shaft inside, and so can be oriented only one way. Replace its holding screw (fig 4: h).

Put the front cover into place. Replace the two screws at its top (above the lens mount) (fig. 2: e, e), the one at the 6 o'clock position (fig. 3: g), and the two screws at its right side (your left as you look at it) (fig 2: c, d).

Put the rubber cover for the grip into place and smooth it down, especially in the valley where the curve meets the flat surface.

Take the left end cover and close the rubber flap completely. Put the cover in place (it just goes straight in). You may need to juggle the cover to steer the tip of the rubber strap on the flap and the adjacent plastic tab into the rectangular slot on the connector panel. Lift the rubber flap and replace the two screws holding this part (fig. 1: a, b).

Replace the viewfinder eyecup and main battery. Replace any removed fittings on the strap loops. Remove the body cap and replace the lens.

CONCLUSION

This completes the procedure. Test the camera for proper operation of the shutter release and associated functions.

ACKNOWLEDGEMENTS

Thanks to Will Thompson for working with me on analyzing the 20D parts catalog and various photos of disassembled cameras to plan the disassembly. Will also piloted many of the steps on an EOS 10D he was working on (there are many similarities in the overall assembly).

Thanks to Gary "GMR2048" for his extensive set of photos of a defunct 20D whose body went to science. I have taken the liberty of using excerpts from two of his photos here to illustrate stages of the disassembly I didn't photograph. And thanks to Gary Gray of the Digital Photography Review forum for calling these photos to my attention.

Thanks also to "Marcel" of the Digital Photography Review forum for his photos of the 20D shutter release switch and of the disassembly of the 20D (he had to replace his shutter too!).

Thanks to Larry Lipstone for calling to our attention a couple of editorial errors in Issue 1.

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ILLUSTRATIONS



Figure 1. Removal of left cover (screws a, b)



Figure 2. Removal of front cover (screws c, d, e, f);
removal of top cover (screw q)



Figure 3. Removal of front cover (screw g)

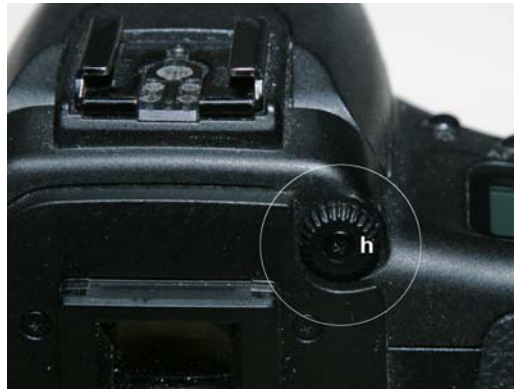


Figure 4. Removal of vision correction ("diopter") knob (screw h)



Figure 5. Removal of back cover (screws j, k, l, m)



Figure 6. Removal of back cover (screws n, p)

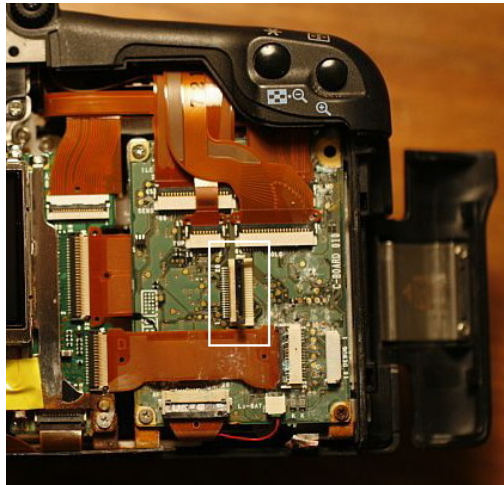


Photo courtesy of "GMR2048"

Figure 7. Removal of back cover—ribbon cable connector (back cover and cable already removed)

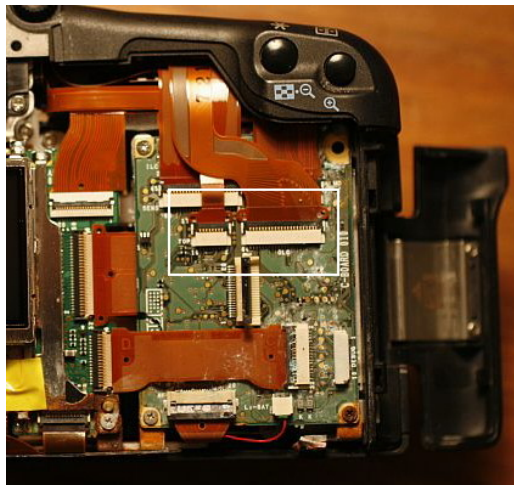


Photo courtesy of "GMR2048"

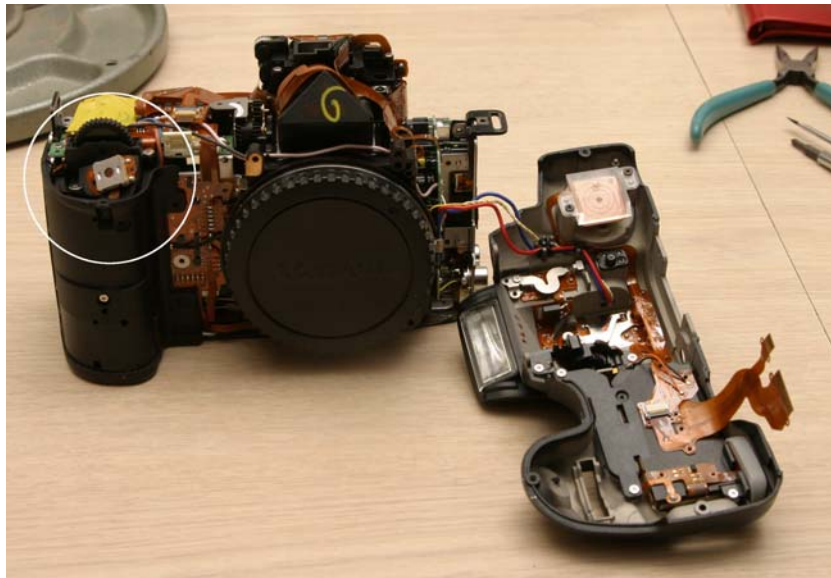
Figure 8. Removal of top cover—ribbon cable connectors



Figure 9. Removal of top cover (screw r)



**Figure 10. Removal of top cover (screw s)
(camera shown upside-down)**



**Figure 11. Top cover removed and set aside;
location of shutter release switch (circled)**

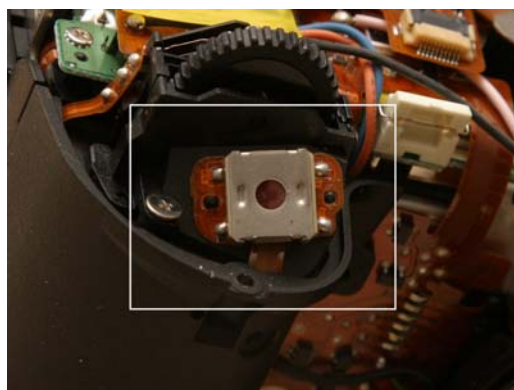


Figure 12. Shutter release switch

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