

# **Adding Vertical Tilt Positions to the Canon Speedlite 550EX Flash unit**

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## **ABSTRACT**

The Canon Speedlite 550EX flash unit provides vertical head tilt for bounce flash operation. Detented positions are only provided for angles of  $-7^\circ$ ,  $0^\circ$ ,  $60^\circ$ ,  $75^\circ$ , and  $90^\circ$ . Other tilt angles are useful for various work. This article describes the modification of the 550EX to add further positions to the detent.

## **GENERAL**

### **Introduction**

The Canon Speedlite 550EX flash unit provides vertical head tilt for bounce flash operation.<sup>1</sup> Detented positions are only provided for tilts of  $-7^\circ$ ,  $0^\circ$ ,  $60^\circ$ ,  $75^\circ$ , and  $90^\circ$ . Other tilt angles are useful for various tasks. Although it is perfectly practical to set the head to angles not supported by the standard detent, this leads to uncertainty in the position, and leaves the risk that the head position can change during use.

It is practical to modify the unit to add further detented positions. This article describes the procedures used by the author in making such a modification.

### **Disclaimer**

The publication of this article does not constitute the recommendation of the author to others to make the modification described here. Anyone does so at his own discretion and risk, and the author cannot be liable for any adverse result thereof.

### **Electrical Safety**

Those who might undertake this modification are cautioned that high voltages are present inside the 550EX flash unit when it is operating, and we are not certain for what period of time after the unit is de-energized hazardous voltages will remain. Persons working on the interior of the unit are urged to be certain they do not contact any exposed electrical terminals.

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<sup>1</sup> It also provides for horizontal head rotation, but that is not involved in the topic of this article.

## Conventions

When we mention right or left sides of the unit, these are as seen by the operator from behind the unit when it is in its normal operating position on the camera.

## PROCEDURE

### Disassembly

1. Remove the batteries from the unit.
2. Remove the rubber ring surrounding the elevation lock button on the right side of the unit and the solid rubber disk opposite it on the left side. The disks are held in place by adhesive. Pry them off with the tip of a pocket knife or equivalent. Do not use a sharp knife (such as a craft knife) as there is a risk of cutting through the disks. Place the disks where the adhesive will not be contaminated. It should be possible to reattach the disks using the existing adhesive.

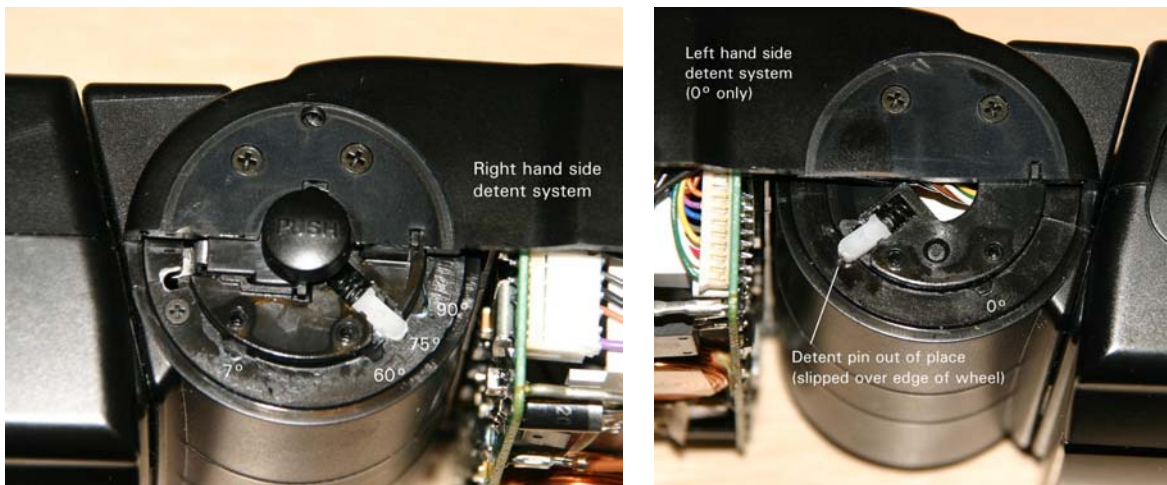


3. With the unit articulated to 75°, place it with the red lenses on the body uppermost.



4. Remove the uppermost two screws (circled in the picture) from the pivot disk on each side. A 2mm Phillips driver is ideal.
5. Remove the two screws (circled in the picture) from the bottom side of the lower head cover). Keep these screws separate from the four screws removed in the preceding step, as they are slightly different. (For future reference, the screws from the pivot disk have almost flat tops, whereas the screws from the lower head cover have slightly domed tops.)
6. Articulate the head to 90° (fully flexed). Remove the lower head cover by pulling it straight up. There are two stirrup-shaped latches extending from the upper head cover (now lowermost) into the lower head cover, where they engage small lugs. (They are near the location of the screw holes in the lower head cover.) To help release these latches, press in on the upper head cover where shown by the small white rectangles on the picture.
7. Remove the rectangular Fresnel lens and set it aside.

**Note:** The original detent arrangement on the right side of the unit provides for positions -7°, 60°, 75°, and 90°. The original detent arrangement on the left side of the unit provides only for the 0° (“normal”) position. The reason for the dual detent is to avoid the problem of the -7° and 0° notches being too close together, as they would have to be if all positions were handled by the same detent..



Note that in the picture, the left side detent pin is out of place (slipped over the edge of the wheel). Sorry about that! (But it could happen to you—see later!)

8. Remove both detent pins and their springs. Be careful not to lose them—the springs can cause a surprise here. (Don’t do any of this over a shag carpet!)

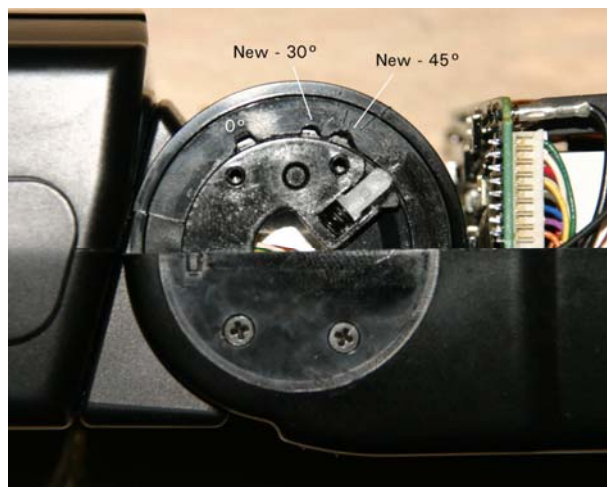
### Adding the new detent notches

We will add the additional detent notch(es) to the left side detent assembly.

9. Mark the location of the desired new detent notches on the face of the wheel. Measure the angle from the  $0^\circ$  notch. A convenient way to do this is to cut small triangles, with the proper apex angle, from light cardboard. Place the triangle having the proper angle for the notch being located with its apex at the center of the opening in the center of the wheel (rather D-shaped, but visualize its center) and one adjacent side aligned with the  $0^\circ$  notch. Scribe a line along the other adjacent side to mark the position of the notch to be added.

In the project here, notches were added for  $30^\circ$  and  $45^\circ$  positions.

10. Cut a new notch centered on each of the marked positions with a sharp craft knife or small pocket knife. It is easiest to do this if you articulate the head until the “pocket” that normally contains the detent pin lines up with the site of the new notch. The pocket gives clearance from which to operate the knife.



Try and make the size and shape of the new notches comparable with those of the existing notches on the right side wheel (not the first or last one, though—they have a little different shape). An exact match is not needed. (I am not proud of my artisanship in that regard as seen in the picture!)

### Reassembly

11. Replace the left side detent pin and spring. This is a little tricky.

On the end of the pin on which the spring seats, there is a little flange on three faces (both sides and the bottom). The pin goes into the pocket with the face having no flange uppermost.

The spring should be put on the pin before attempting to put the pin in place. It can be helpful to put a little grease on the short tapered peg on the back end of the pin, over which the spring sits, in order to keep the spring in place.

Grip the pin from its end away from the spring with small pliers, with the jaws on the top and bottom faces of the pin. Head the pin and spring assembly into its

pocket, spring end first. Press the pin back, compressing the spring, and then lower it into the pocket. Be sure that the flanges on the sides of the pin get behind the small retaining ridges on the sides of the pocket

12. Articulate the head through all positions to be sure the modified detent works properly. You may need to hold your finger on top of the pin to make sure it doesn't hop out while articulating the head.

13. If everything is in good order, replace the detent pin and spring on the right side, using the same procedure as before. When you finish, be sure that each pin is now seated either in a detent notch or riding against the inside diameter of its ring (not hopped out as in the earlier picture!).

You may find that it is hard to keep the pins from hopping out. (They will of course later be trapped in the proper plane by the surface of the lower head cover, but you will not be able to replace the cover if a pin is hopped out at the time.) If a pin will not stay in place, you may find it helpful to roughen its tip a little with sandpaper. This will slightly increase the friction between the tip and the inside diameter of the ring, helping keep the pin in place while the lower head cover is replaced.

14. Replace the Fresnel lens in the grooves in the upper head cover. The face with the circular grooves goes outermost; the edge with the little tab goes in first.

15. Replace the lower head cover. You will need to be sure that the Fresnel lens is properly lined up with its recess in the lower cover. You may need to press the cover a bit to make the two latches engage.

16. Replace the two screws in the bottom of the lower head cover. (Remember, these are the screws with a slightly domed top surface.)

17. Replace the two screws in each of the pivot rings. Check the other two screws in each ring to be sure they are properly seated.

18. Replace the two rubber disks. Each has a small pin which fits into a hole on the recess of the head covers to properly orient the disk. Press each disk firmly in place.

19. Put the batteries back in. You are ready to go!

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