Replacing the Focusing Screen on the Canon EOS 20D Digital SLR Camera

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ABSTRACT

This article gives step by step instructions for replacing the focusing screen on the Canon EOS 20D digital SLR camera, with some illustrations.

INTRODUCTION

The focusing screen on the Canon EOS 20D digital SLR camera may be readily changed in the field. Often this is desired in order to replace the factory screen with an alternative screen having manual focusing aids, such as a split image prism and/or a microprism field, or merely to replace a damaged screen.

The details, including the information on determining the proper orientation of the new screen, are predicated on the installation of a new OEM screen or an "aftermarket" screen closely adhering to the configuration and dimensions of the OEM screen. If you have a screen for which this is not so, please get the necessary supplemental information from the manufacturer or distributor.

I understand that with some aftermarket screens, the shim installed at the factory to properly position the focusing screen must be removed. If you have such a screen, please get the necessary supplemental information from the manufacturer or distributor.

Do not be dismayed by the length of these instructions. The procedure is straightforward. I have given a lot of detail to avoid any misunderstanding. Thorough preparation and attention to detail are the key to a successful "operation", and I have included many "hints and kinks" that can make the process easier and safer (especially the first time!).

CAVEAT

The author has prepared these instructions based on his best knowledge and experience. Any user will undertake this procedure at his own sole discretion, and risk and the author cannot be responsible for any result not considered satisfactory.

ORIENTATION

Except where mentioned otherwise, directions referenced herein ("up", "down", "toward", "away") are from the perspective of the technician and with the camera in the service position recommended here: its back on the table with the camera top away from the technician.

TOOLS AND MATERIALS

The following tools and materials are recommended for the procedure described by this article:

- Clean washcloth, small cloth towel, etc.
- Sheet of white bond paper
- Scissors
- (Optional) One Pec Pad or equivalent (camera lens wipe)
- Small tweezers with smooth flat tips (be sure they have no sharp edges or "burrs")
- Round wood toothpick (must have fairly sharp point)
- Camera dust blower or ear syringe
- Small block of wood about the size of a small matchbox (or a matchbox)
- Replacement focusing screen

If a dental mirror is available, it is very helpful in studying the battle zone to get an appreciation of where the retaining frame latch is, and may be useful in the actual procedure.

PREPARATION

1. Make sure your work table is clean and well lighted.
2. Place a clean washcloth or equivalent on the table. The camera will be set on this during the procedure. It helps prevent the camera from sliding around when that is not wanted.
3. Place a Pec Pad or a cleanly-cut piece of bond paper about 4"-6" square on the table next to the cloth (not on it). Be sure the paper pad is free of foreign matter. This will be used for the focusing screens and other parts.
4. Blow the air blower toward the floor to expel any foreign material from it.
5. Wash and dry your hands well.
6. Make sure it is quiet in the work area. You will need to listen for a small "click" when the retaining frame is replaced.
7. We always shut down the furnace/air conditioner to minimize the amount of air/dust circulation during the procedure.

PROCEDURE

8. Hold the new focusing screen by the edges and blow off both faces with the blower.

9. Set the new screen flat on the paper pad with the "top surface" up and the "rear edge" away from you. The top surface is the one that has a small "step" around its edges (as if there were a thin slightly smaller plastic rectangle on top of the main body of the screen). The rear edge is the long edge with a single tab at the center. See figure 1, which shows the standard 20D focusing screen:

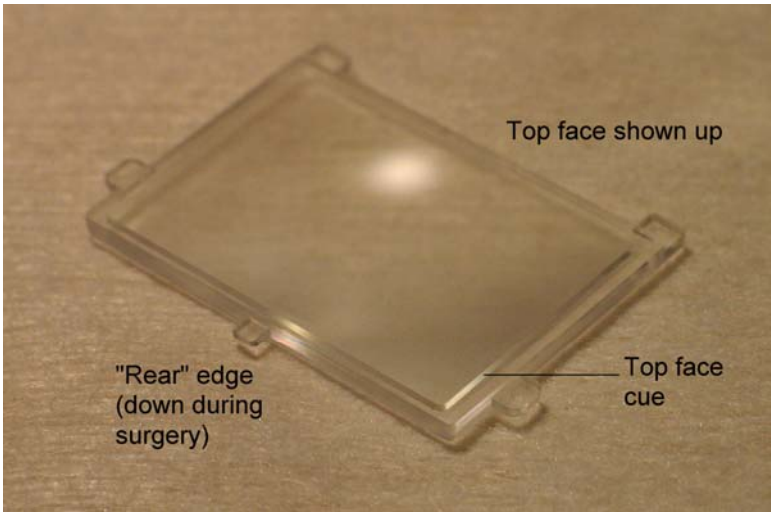

Figure 1. Standard 20D focusing screen

10. Turn the main switch on the camera OFF.

11. Remove the viewfinder eyecup from the camera (this will allow the camera to lie more stably on its back).

12. Remove the lens from the camera and set it out of the way.

13. Hold the camera with the lens opening generally downward and blow into the hole with the blower to dislodge as much dust as possible from the mirror box.

14. Lay the camera on its back on the cloth, with the top of the camera away from you.

15. It is desirable to cover the reflex mirror with a paper "drape" to protect the mirror against fingerprints and also against the possibility of scratching by the various parts (or tools!) that may fall on it during the process. Cut a strip of bond paper the width of the reflex mirror (1-1/8", slightly under 29 mm) and about 2-1/8" (54 mm) inches long. Cut one end to a curve, approximately the radius of the inside of the shiny mount ring. (See figure 2.) Place the strip on the mirror, with the far end lying at the base of the two "columns" and use a

small tab of transparent tape or masking tape to hold the curved end to the mount ring.

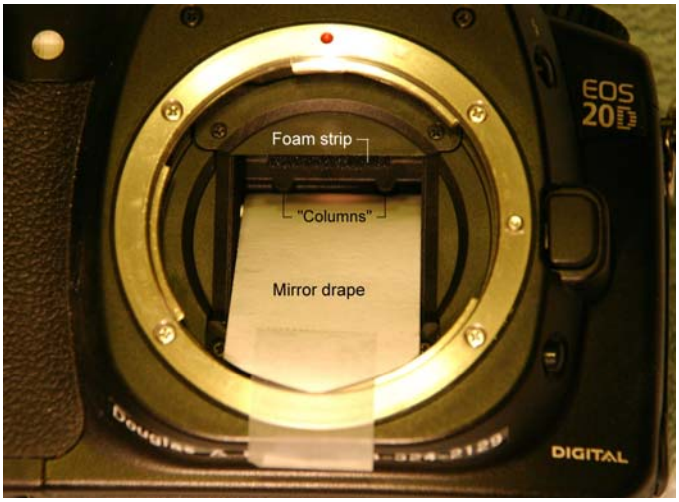

Figure 2. Mirror drape

16. Remove the focusing screen retaining frame. Figure 3 shows the frame. The small hole in the latch is intended to be engaged by a tool to release the latch (we will use the round toothpick). The bow-shaped spring fingers are what actually press on the focusing screen to hold it in place.

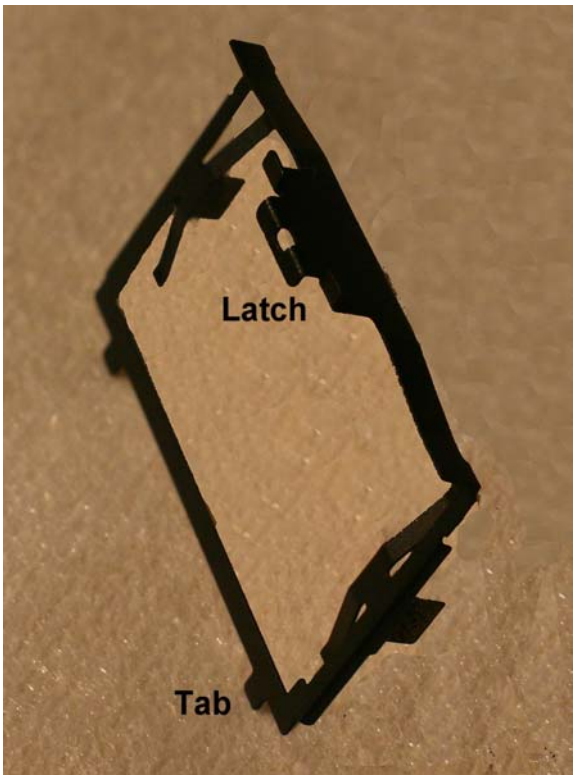

Figure 3. Focusing screen retaining frame

Figure 4 shows the way the frame is latched in place. The foam strip can be seen in figure 2.

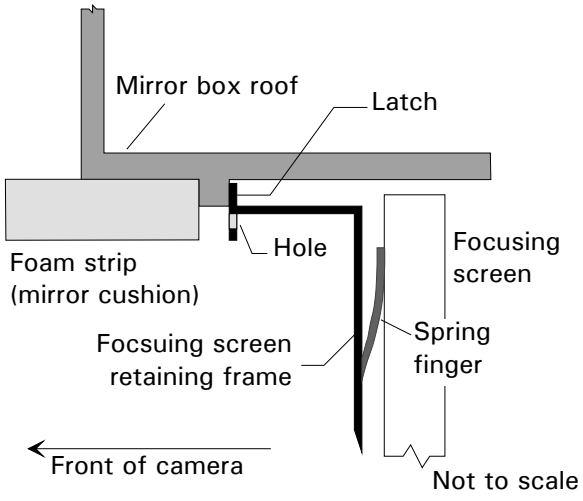

Figure 4. Retaining frame and latch—section from side

Slide the round toothpick straight under the very center of the foam strip. The other end of the toothpick must lie on the shiny mount ring for it to enter the battle zone at the proper angle. Lift the tip of the toothpick up so as to squeeze the foam strip. (You can see from the figure above why this is necessary if the tip of the toothpick is to reach the hole in the latch.) You should be able to insert the tip of the toothpick into the small hole in the latch. Press a little bit and twist the toothpick so it will lodge in the hole. Use the toothpick to press downward on the latch and then pull the latch toward you. The retaining frame should pivot away from the focusing screen.

As you draw the frame out, maintain downward pressure on the toothpick to depress the latch so it does not drag on the bottom of the foam strip, which could damage the foam strip. Do not use any more downward pressure than is necessary, or you could bend the latch spring.

You may be able to remove the frame from the camera using the toothpick as a handle. If not, grasp the frame with the tweezers and remove it. With it still impaled on the toothpick, set it on the paper pad.

17. Rock the camera slightly toward you (that is, lift the top of the camera) by about 30-45°, lift the camera slightly off the cloth, and "bump" the camera onto the cloth. The focusing screen should fall out of its place and land on the paper drape on the mirror. If it does not, urge it out using the tweezers.

18. Grasp the focusing screen by one of the tabs with the tweezers and remove it from the camera. Lay it on the paper pad.

19. Pick up the camera and hold it so that its top is downward with the mount facing you. Use the blower to gently blow into where the focusing screen was. Among other things, this cleans off the bottom of the *indication plate*, which carries the AF point indicator icons and the partial metering scope circle. This camera position is intended to reduce the likelihood that this blowing would dislodge the frame-like shim in front of the indication plate.

    If, nevertheless, the shim has come only a little out of place, push it back with the tweezers. If it has come completely out of place, see the section on Shim Installation at the end of this article for detailed instructions on replacing it. (That section includes a photo showing the proper shim position.) Return the camera to its prior service position.

20. Confirm that the new screen is in the proper orientation on your paper pad. The top side should be up; the edge with the single tab should be away from you.

21. Grasp the new screen very gently with the tweezers by one of the two tabs on the edge nearest you.

22. Set the "far" edge of the screen (with the single centered tab) into place in the camera at the bottom (to you) edge of the screen opening. The tab will go into a small recess.

23. Tilt the camera away from you until the screen falls away from you into its place. If it doesn't, help it with the tweezers.

24. Place the wood block or matchbox under the near edge of the camera so it does not tilt back to its original position. (The screen might fall out of place if that happens.)

25. If it isn't already, impale the retaining frame on the toothpick, move it into the battle zone using the toothpick as a handle, and position it so the two small tabs of the "far" edge of the frame go into the small rectangular recesses that are just in front of the lower edge of the screen (as you see it).

26. Tilt the frame up toward the screen, using the toothpick as a handle. As the latch approaches the foam strip, **maintain downward pressure on the toothpick to depress the latch so it clears the bottom of the foam strip. Do not use any more downward pressure than is necessary, or you could bend the latch spring.** The latch will disappear under the foam strip. Release the downward pressure on the toothpick and press the tab "home". You should hear a small click as it latches into place.

    Look to see if the retaining frame seems to be parallel with the screen—the spring fingers equally deflected. If not, press the latch further. If all is in order, remove the toothpick. You will probably need to "unscrew" it from the latch hole.

27. Remove the paper drape covering the reflex mirror.

28. Hold the camera with the lens opening down and blow out the interior.

29. Replace the lens.

30. Replace the viewfinder eyecup.

31. If your habit is to leave the camera switch on, turn it on.

32. Properly wrap and store the replaced focusing screen.

33. Check the operation of the camera and the new focusing screen.

SHIM REINSTALLATION

There is a thin frame-like "shim" behind the focusing screen (toward the top of the camera), between the screen and the indicator plate (which carries the icons for the AF point indication). This shim is chosen at the factory for its thickness to properly locate the focusing screen for correct focusing operation.

This shim can be dislodged during focusing screen replacement, especially when using the blower to clean out the recess where the screen goes after the original screen has been removed.

This section gives information on the proper reinstallation of the shim.

34. Figure 5 shows a typical shim, and identifies its orientation.

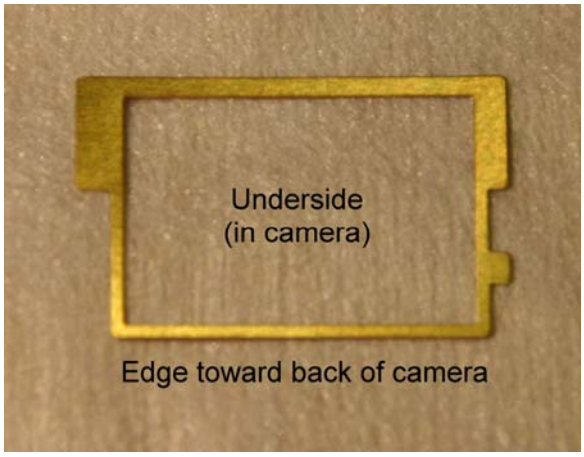

Figure 5. Shim

We see the face of the shim that will be down in the camera (and will be nearest us as we work on the camera). The lower edge in the figure will be nearest the back of the camera—at the bottom as we work on the camera.

35. Figure 6 shows the proper position of the shim.

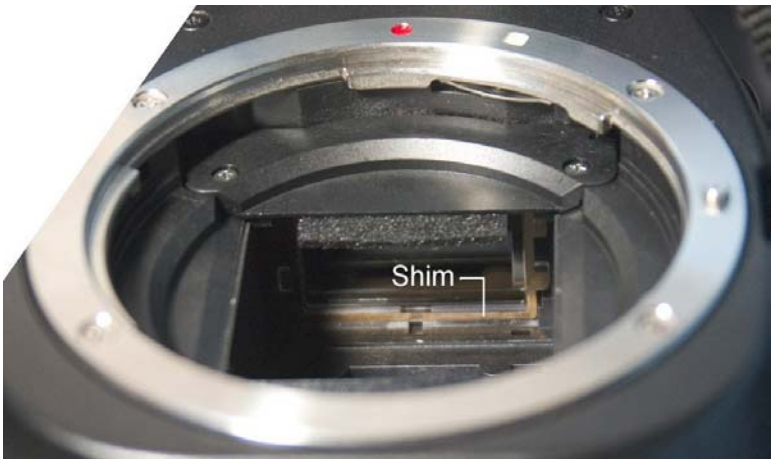

Figure 6. Shim position

36. If the shim is slightly out of this position (perhaps the lower edge has come forward and dropped a little, as seen from your vantage point), move it into the proper position by lifting the bottom edge (with tweezers or another small instrument) and pressing it back into place.

37. If the shim is totally dislodged, it is easiest to replace by taking the camera to hand with its top down and the lens mount facing you. Figure 7 shows the camera in this new orientation.

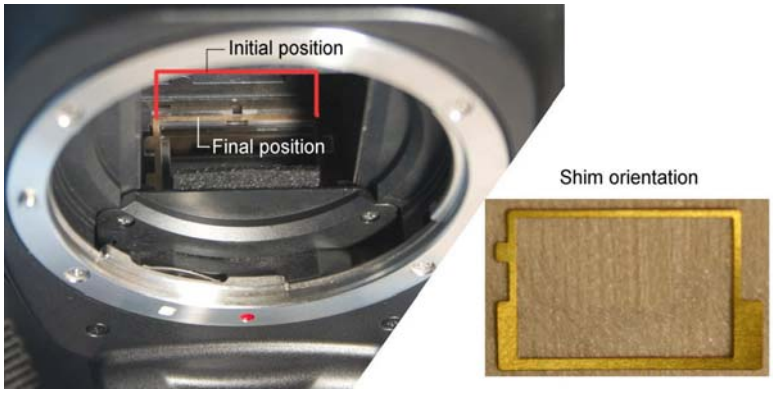

Figure 7. Installation of shim

38. With the shim oriented as shown in figure 7, drop it into about the spot where it goes. The edge near you will need to be under the foam pad (as seen from your vantage point), and so that edge should be put in first. The shim will probably land too far toward the back of the camera (as seen in the figure in red). Move it into the proper final position with the tweezers.