Canon EOS

AF Microadjustment Guidebook

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What is AF Microadjustment?

It is a function that makes it possible to make fine adjustments for the focus system's plane of sharpest focus, for AF *during viewfinder shooting.* You can select from two types, "Adjust by lens" and "All by same amount."
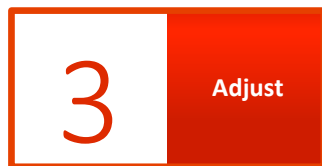
1 Preparation	**AF Microadjustment preparations** 1. Shooting environment for the adjustment test 2. Camera and lens settings
2 Shoot & confirm	**Perform test shooting** 1. Shoot images to check the AF 2. Points when comparing the images 3. Confirm the images
3 Adjust	**Perform AF Microadjustment** 1. Adjust by lens 2. Register the lens serial number 3. Adjust "All by same amount"

AF Microadjustment important information

The AF point of focus may vary slightly due to shooting conditions such as subject conditions, its brightness, and the zoom position. Therefore, even if you perform AF Microadjustment, the point of focus may not always be at the suitable position.
If you feel that focusing errors are not fixed after using this function several times, contact a Canon service center.
We appreciate your understanding that if repairs are necessary, there may be a charge for equipment out of warranty.
• *Adjusted content has no effect in the AF during Live View shooting or movie shooting.*
• *Even if the camera settings are reset, adjustment content will remain, however, settings will be set to [Disable].*

EOS cameras offering AF Microadjustment

(as of mid-2016)

EOS 50D camera

EOS 70D camera *(note: AF Microadjustment not available on EOS 60D)*

EOS 80D camera

EOS 7D camera

EOS 7D Mark II camera

EOS 6D camera

EOS 5D Mark II camera

EOS 5D Mark III camera

EOS 5DS, 5DS R cameras

EOS-1D Mark III; EOS-1Ds Mark III cameras

EOS-1D Mark IV camera

EOS-1D X camera

EOS-1D X Mark II camera

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Situations that require AF Microadjustment

When AF does not focus on the targeted position in situations like these,
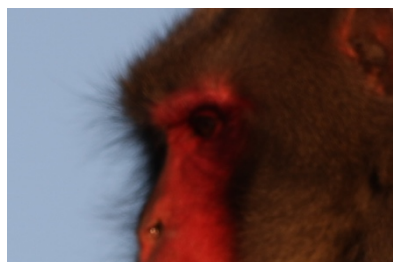it's possible to change the plane of sharpest focus by performing AF Microadjustment.
AF Microadjustment occurs within each camera body, and not in the lens itself.
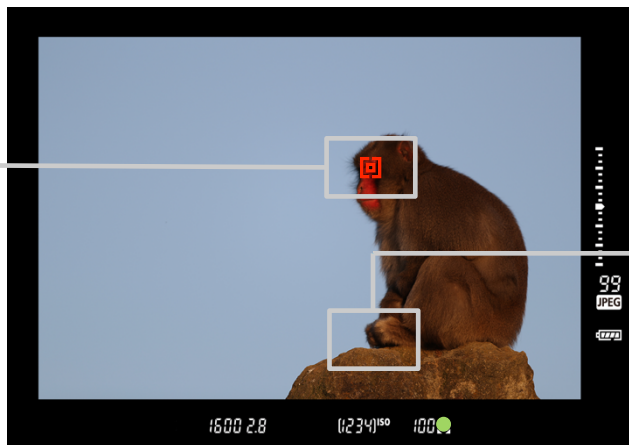

An AF point on the face was selected, but the result is slightly out of focus.

The sharpest plane of focus is on the ball, slightly in front of the face, which means the result is front focus.

An AF point on the face was selected, but the result is slightly out of focus.
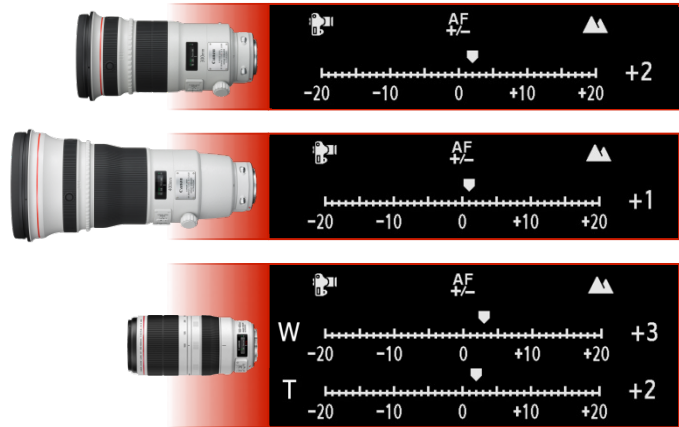
The sharpest focus is on the rock, slightly in front of the face, which means the result is front focus.

Types of AF Microadjustment

You can select from two types, **"Adjust by lens"** and **"All by same amount"**
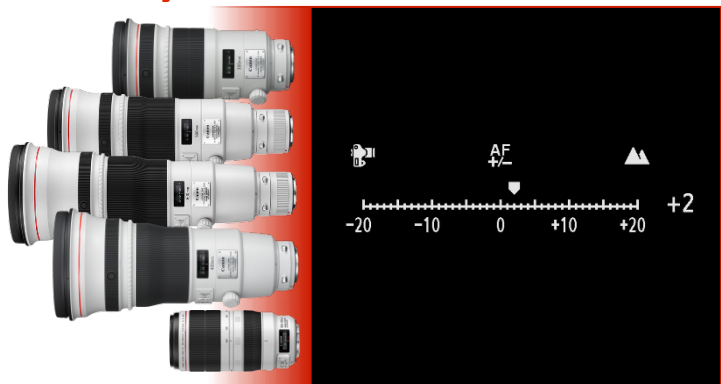
Adjust by lens

+2
+1
W +3
T +2

Info

Adjustments for up to 40 individual lenses can be entered and stored in-camera. When a recognized lens is mounted, those stored AF adjustments will automatically be applied to AF. Different samples of the same model lens can have separate adjustment values entered to the camera. With select EOS cameras, it's possible to make adjustments to both the wide-angle (W) and telephoto (T) ends.*

* EOS 70D, 80D; EOS 7D Mark II; EOS 6D; EOS 5D Mark III, 5DS, 5DS R; EOS-1D X and EOS-1D X Mark II cameras only

AF Microadjustment

EF400mm f/2.8L IS II USM
Adjust focus for each model of lens individually

Disable
All by same amount   ±0
Adjust by lens   ±0
INFO. Register   🗑 Clear all

All by same amount

+2

Info

This is effective when focus tends to be in front (or behind) the targeted position, no matter which lens is used. After registering it once, regardless of the lens used later, the camera's AF will always be corrected by the adjustment value.

AF Microadjustment

Adjust focus for all lenses by the same adjustment amount

Disable
All by same amount   ±0
Adjust by lens   ±0
INFO. Change   🗑 Clear all

1 | Shooting environment for the adjustment test

1 Light environment

Test in conditions that are the same as when usually shooting. Outdoors if shooting outdoors, and indoors if shooting indoors.
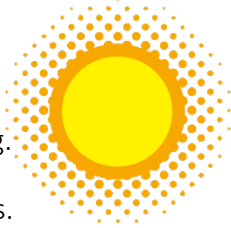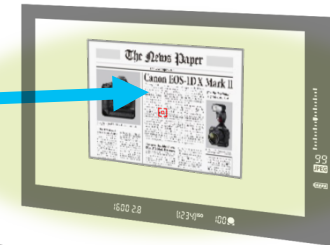
2 Shooting distance

Maintain a distance that is the same as when usually shooting. When it is not possible to ensure the distance, shoot at a distance of 50x the lens focal length.*

(Example: For 400 mm lens, the distance is 20 meters / 66 feet)

Precise focus adjustment may not be possible with test shots taken at a distance that differs significantly from typical actual shooting distance.

3 Subject

Mount a page from a newspaper or magazine, with text that has a high contrast, on a flat surface you can position upright.
If possible, select a page with illustrations, large text, and that is black and white with good contrast.

4 Subject location

Install the subject on a textured, detailed surface, such as a carpet, stone-paved ground, or grass.
(See example on far left, slide #7.)

6 Focus confirmation

Verify sharpest plane of focus on a computer, enlarging the image to 100% on computer's screen.

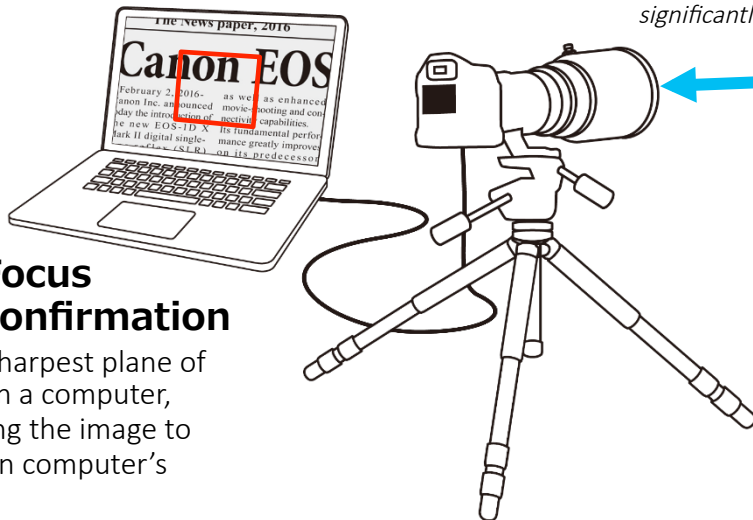*Confirm on the camera's LCD monitor if a computer is not available.*

5 Height of the camera

Handheld is not a problem, however, if possible, install the camera on a monopod or tripod at the same height as the subject. It's important to shoot as squarely into the subject as possible. With handheld shooting, or if using a monopod, turn on the IS (Image Stabilizer) function of lenses with IS.

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2 Camera and lens settings for tests

1	Shooting method	Viewfinder shooting
2	Shooting mode	Av mode
3	Aperture value	Maximum aperture of the lens used *When shooting at the maximum aperture of a wide-angle lens, aberration may occur.*
4	Shutter speed	Set to a shutter speed where camera shake does not occur.
5	ISO speed	Set to the value normally used. *When shooting with a monopod or handheld, shoot at fast enough speeds to avoid shake — even if this means using high ISO settings*
6	White balance	Set to the value/item normally used.
7	AF mode	One-Shot
8	Metering mode	Set to the mode normally used. *In order to confirm the point of focus, set it so the ground surrounding test subject is properly exposed.*
9	Drive mode	Single shooting
10	Picture Style	Set to Standard (sharpness settings such as Strength, Fineness, and Threshold should be set to 3).
11	AF area selection mode AF point	Select "Manual select: Spot AF" and use the center AF point. *Adjustment is not possible during ⌖+Tracking and FlexiZone-Single.*
12	Image size	JPEG L
13	Image quality	JPEG image quality: Set to 8 or higher ***
14	Lens	If the IS function is equipped, turn it on. *It can be turned off if using a firmly fixed tripod.* ** EOS-1D series models only*
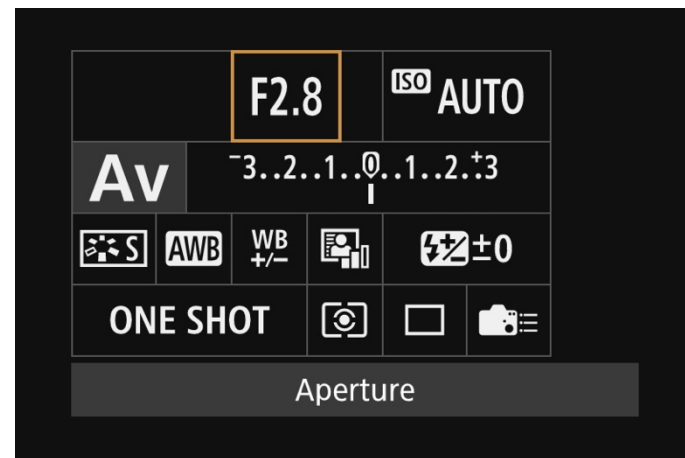
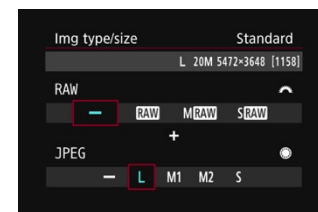Settings can be made easily using the quick setting menu.

[**Picture Style**] Standard
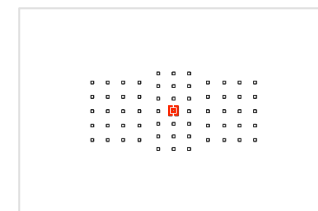
[**AF area**]
Select Single-point Spot AF (manual selection), and set to the center point.

[**Image quality**
  (EOS-1D series)]
Compression [8] to [10]
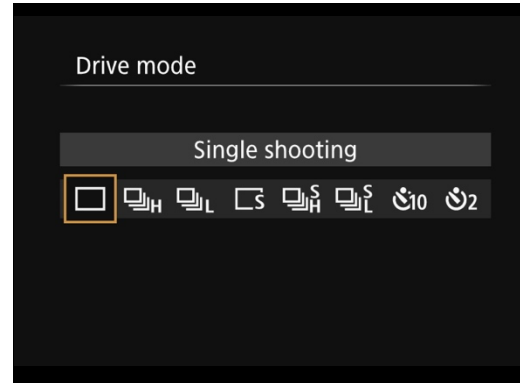
[**Image size**]
JPEG L

1 | Shoot initial test images to check the AF

### 1. Shoot with One-Shot AF *(compose similarly to this)*

With the AF set to [**One-shot**], select [**Manual select: Spot AF**] for the AF area selection mode. Place the subject in the center of the screen, similar to the example directly above.

2. Shoot about five images in [Single shooting] mode

Shoot about five or six test images, one picture at a time. Manually throw lens out-of-focus after each shot (see below). The [**Single shooting**] drive mode is appropriate.

3. Playback enlarging it on the computer
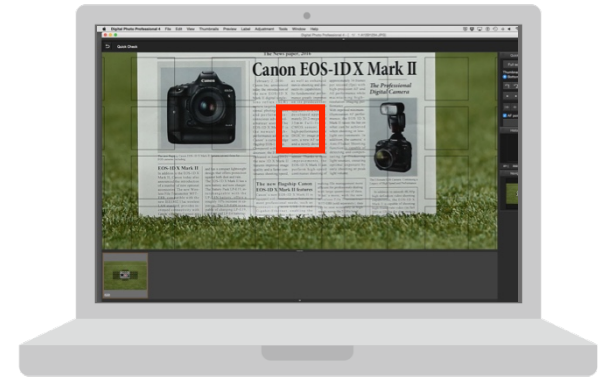
Examine the initial test images, enlarging them on the computer.   Playback on the camera's rear LCD monitor if a computer is not available is OK, but using a desktop or laptop computer monitor is preferable.

Tips

Adjust the focus for each shot

Set the AF mode to [**One-Shot**] during test shooting. Before shooting each image, turn the focus ring slightly to throw the lens out of focus each time, then shoot using the autofocus. This forces the AF system to calculate focus on your target, and drive the lens to the intended plane of focus for each test shot you take.

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2 | Points when comparing the images

Check on a computer monitor (100% display)

Confirm the test shot images on a computer. Look at the focus of the subject and the pattern where it is placed, *and especially look at the surrounding areas to see if any tendency for sharpest focus to be behind or in front of test subject.* In **Digital Photo Professional 4**, play the images to 100% (unmagnified) to confirm the point of focus is easy and the selected AF point(s) can also be displayed.

With DPP 4

Shoot several images and find the average point of focus

To confirm the AF tendency, perform AF for each image in the [**Single shooting**] mode, and shoot several images of the subject. From these, you can determine whether the AF system can consistently place sharpest focus at the intended plane you're trying to focus upon. *In addition, if you are using a zoom lens, shoot test images for both the wide-angle (W) and the telephoto (T) ends, with select EOS models that offer this — see list on page 4.*

Example:

OK	Front focus	Front focus	Front focus	OK
1	2	3	4	5
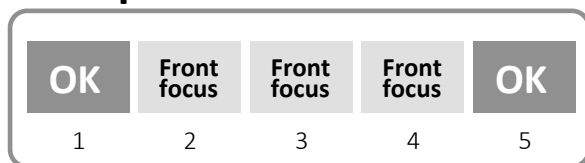
Front focus tendency

Rear focus	OK	OK	OK	Rear focus
1	2	3	4	5

Rear focus tendency

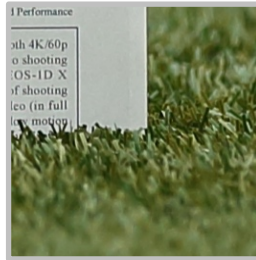| OK	OK	OK	OK	OK
1	2	3	4	5

Adjustment unnecessary

Note: *Focus may vary due to the influence of heat haze, etc. Shooting several times is recommended.*

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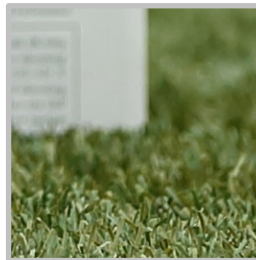
3 | **Confirm the images**

1. AF is accurate in all test shots

OK — **Focus is accurate overall**

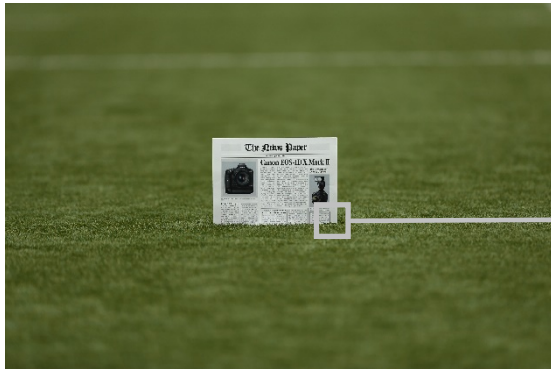**2. The point of focus is slightly in front of the targeted position (front focus)**

No Good — **Adjust toward the " + ▲▲ " side**

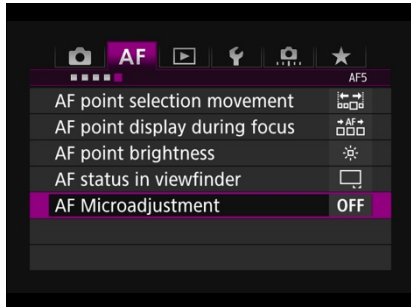**3. The point of focus is slightly behind the targeted position (rear focus)**

No Good — **Adjust toward the " − ▶ " side**
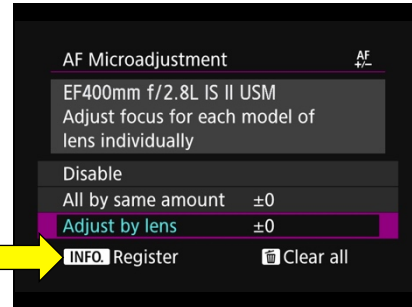
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1 | Option 1, if adjustment is needed: Adjust by lens

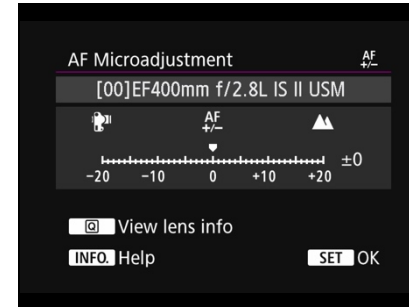## 1. Select AF Microadjustment

Select [**AF Microadjustment**] from the [**AF5**] tab, and press the <⊕> button.
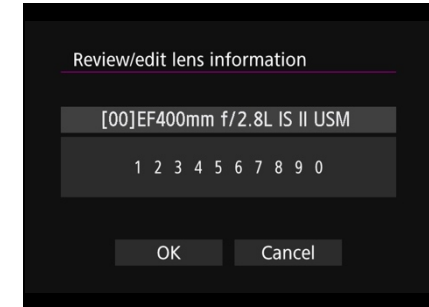
2. Select [Adjust by lens]

Turn the <⊙> Quick Control Dial and select [**Adjust by lens**], then press the <**INFO.**> button.

3. The adjustment screen is called up

Confirm that the [**Adjust by lens**] screen is displayed. If "All by same amount" is displayed instead of an individual lens, repeat Step 2.

4. Confirm/edit the lens information

Press the <Q> or <**INFO**> button.
● The screen will show the lens name and a 10-digit serial number. When the serial number displays, select [**OK**], and proceed to procedure 1_5 (P. 11).
● If the lens serial number cannot be confirmed,"0000000000" will be displayed. In this case, enter the number by following the instructions on the next page. Refer to P. 13 regarding the "*" displayed in front of some lens serial numbers.

Notice	Zoom lens focal length

Zoom lens focal length
When shooting with the intermediate range (focal length) of a zoom lens, the AF's point of focus is corrected automatically relative to the adjustments made for the wide-angle and telephoto ends. Even if only the wide-angle or telephoto end is adjusted, a correction will be applied automatically for the intermediate range.
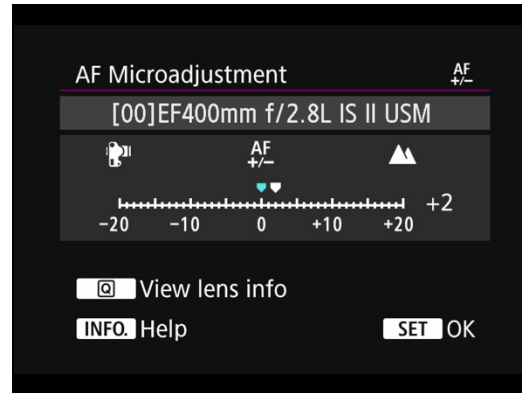
1 | Adjust by lens

5. Input the serial number
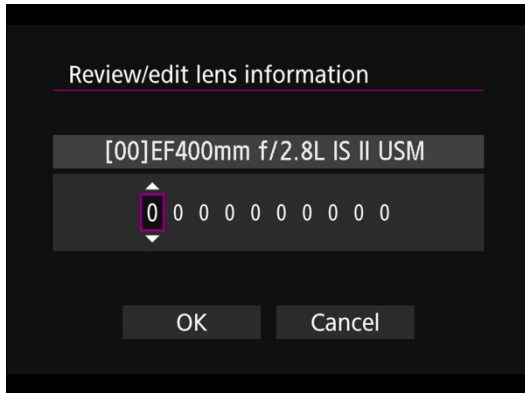
1. Turn the <⊙> Quick Control Dial and select the digit to be entered, then press the <SET> button so <▲> is displayed.
2. Turn the <⊙> Quick Control Dial and enter a number, then press the <SET> button.
3. After entering all of the digits, turn the <⊙> Quick Control Dial, select [**OK**], then press the <SET> button.

6. Make adjustments
(With a single focal length lens)

Turn the <⊙> Quick Control Dial and set the adjustment value. The adjustable range is ±20 steps. Based on the initial test shots…

● Setting it toward " – 🎥 " will shift the plane of sharpest focus forward, toward the camera.

● Setting it toward " + 🏔 " will shift the plane of focus away from the camera, behind where it is now placing sharpest focus.

● Be sure to press **SET** button to lock-in your desired adjustment value(s).

(With a zoom lens)
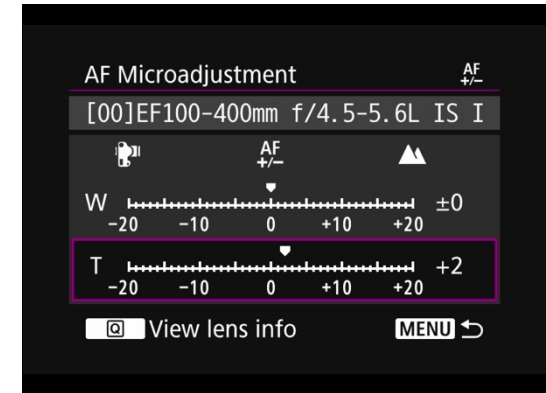
1. For a zoom lens, turn the <⊙> Quick Control Dial and select either the wide-angle (W), or the telephoto (T). Pressing the <SET> button will turn off the purple frame and make the adjustment possible.
2. With EOS cameras offering both (W) and (T) values, enter both on the Menu screen.
   Please note: See list of cameras allowing both (W) and (T) adjustment values, on Page 4.
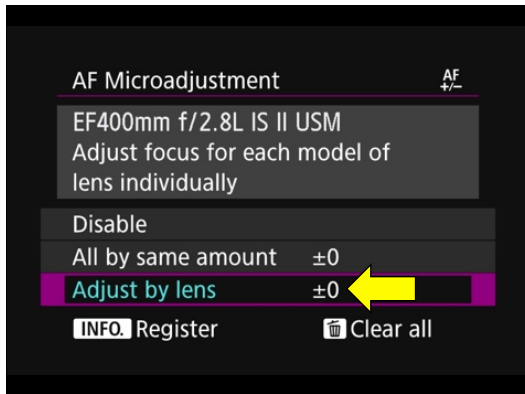

Tips

Make adjustments of two steps at a time
The adjustment quantity of one step will differ according to the maximum aperture of the lens being used. First, move two steps, repeatedly making adjustments, test shooting, and checking the results each time until the desired result is achieved.
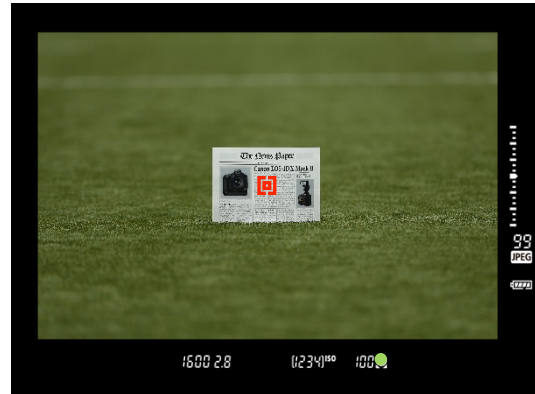
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1 | **Adjust by lens**

7. Verify your adjustment

1. After you've entered Microadjustment values and pressed the <SET> button, you should return to the screen above. (If not, press the MENU button.)
2. Verify that the amount you dialed-in appears next to "Adjust by lens" on the Menu screen (see yellow arrow).

8. Perform test shooting after the adjustment

Perform test shooting again to check the effect of your adjustment(s).

9. Confirm on a computer
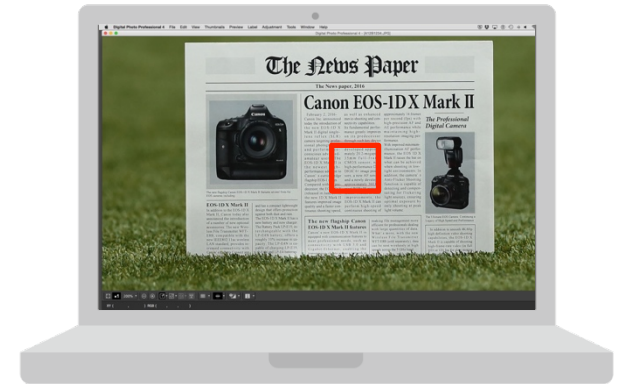
Playback the images and confirm the adjustment results. Adjustments are complete if the AF's point of focus is accurate. If further adjustments are necessary, repeat **making adjustments, shooting, and checking the results** and adjust to the suitable point of focus .
- If the shooting result's focus is in front of the targeted point of focus, adjust to the " +▲▲ " side, and if focus is behind, adjust to the " – ▮▮▮ " side.
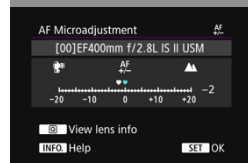
Tips	**Repeatedly make adjustments, shoot, and check the results, if necessary**
	After entering an adjustment value, **_repeat test shooting_** to **confirm** the result. After checking new test shots, if the adjustment value is insufficient, change it. Repeat this as necessary, and examine each set of test shots to see and verify whether the sharpest plane of focus is indeed at the test subject, or continues to be behind or in front of the test subject.

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2 Register the lens serial number

Serial number and lens registration
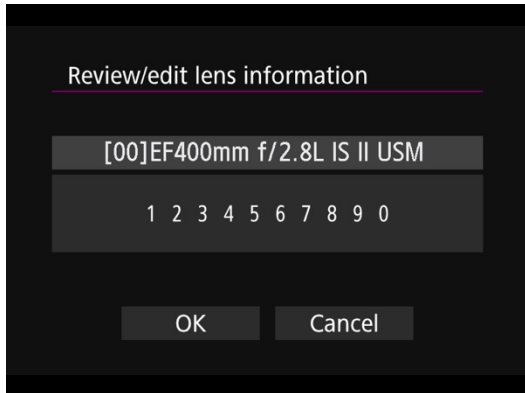
Up to 40 lenses can be registered. A message will appear if 40 lenses have already been registered. To register another lens, one existing registered lens must be erased.

- In procedure 1_4 (P. 10), if "*" appears in front of the 10-digit lens serial number, you can register only one unit of the same lens model. Even if you enter the serial number, "*" will remain displayed.

- The serial number listed for a lens may differ from the serial number displayed in procedure on Page 10, however, this is not a malfunction.

- If the lens serial number includes letters, enter only the numbers by following the procedure 1_5 (P. 11).

- If the lens serial number is 11 digits or longer, enter the last 10 digits.

- The location of the serial number varies depending on the lens.

- Some lenses may not have a serial number inscribed. To register a lens that has no serial number inscribed, enter any serial number by following the procedure on Page 10.

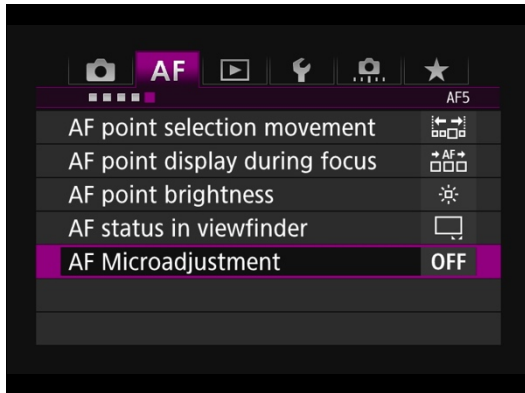### Tips
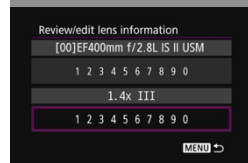
Using an extender

If [**Adjust by lens**] is selected and an extender is used, the adjustment will be registered for the lens and extender combination.
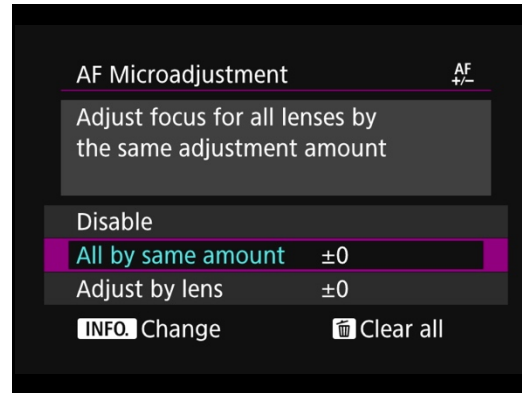
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3   Option 2, if adjustment needed: Adjust "All by same amount"
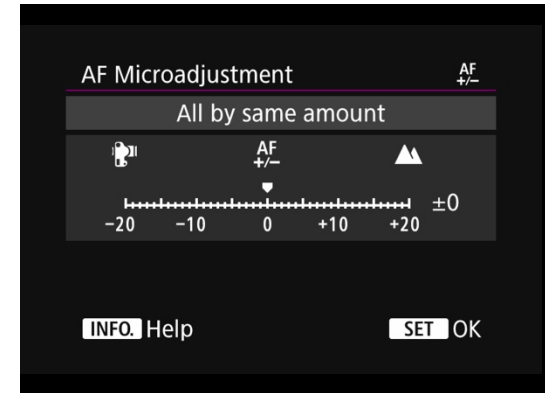
1. Select AF Microadjustment

Select [**AF Microadjustment**] from the [**AF5**] tab, and press the < (SET) > button.

2. Select [All by same amount]

Turn the < ⊙ > Quick Control Dial and select [**All by same amount**], then press the <**INFO.**> button.

3. The adjustment screen is called up

The [**All by same amount**] screen is displayed.

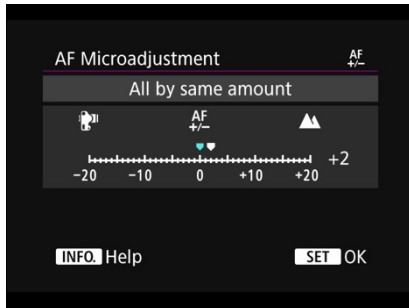**Notice** | **Zoom lens adjustment**

If [**All by same amount**] is selected, separate AF adjustment will not be possible for the wide-angle and telephoto ends of zoom lenses (applies only to the select EOS cameras listed on Page 4).
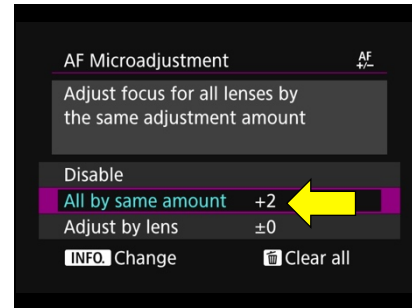
3 | Adjust "All by same amount"

4. Make adjustments

Turn the < ⊙ > Quick Control Dial and set the adjustment value. The adjustable range is ±20 steps.
- Setting it toward " − 🎥 " will shift the point of focus in front of the standard point of focus.
- Setting it toward " +⛰ " will shift the sharpest plane of focus behind where the camera had placed sharpest focus.

## 5. Determine with the <SET> button

1. When adjustment is finished, press the < SET > button.
2. You should return to the menu screen above (press MENU button if it doesn't).
3. Verify that the amount you dialed-in appears next to "All by same amount" (yellow arrow, above).

6. Perform test shooting after the adjustment

Perform test shooting again to check the results of your adjustments.

7. Confirm on a computer
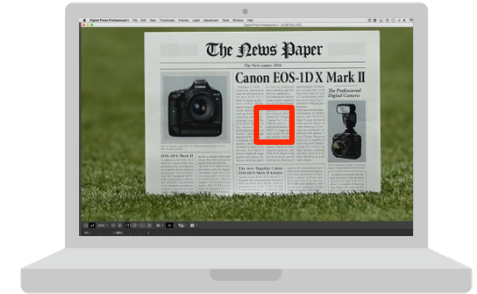
Playback the images and confirm the adjustment results. Adjustments are complete if the AF is accurate.
- When the shooting result's focus is ahead of the intended plane of focus, adjust it toward "+⛰", and if it is behind, adjust it toward "− 🎥".

Tips

When you want to clear all AF Microadjustment registered data

When [🗑 **Clear all**] appears at the bottom of the screen, pressing the < 🗑 > button will clear all the adjustments made for [**All by same amount**] and [**Adjust by lens**].

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Appendix Subjects where AF may not perform well

Autofocus can fail to achieve focus with certain subjects and environments. Even when the test environment is similar to the actual shooting environment, note that it may not be possible to perform an appropriate AF Microadjustment in these cases. A mistaken adjustment may cause the camera to be unable to achieve its optimal performance.

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1. Subjects with very low contrast
Example: Skies, monochromatic flat surfaces, etc. (includes heat haze)

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2. Subjects in very low light

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3. Strongly backlit or reflective subjects
Example: Cars with highly reflective bodies, etc.

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4. Near and distant subjects framed close to an AF point
Example: Animals in cages, etc.

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5. Subjects such as dots of light framed close to an AF point
Example: Night scenes, etc.

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6. Subjects with repetitive patterns
Example: Skyscraper windows, computer keyboards, etc.

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7. Subjects with finer patterns than an AF point
Example: Faces or flowers as small as, or smaller than an AF point, etc.

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Appendix Approximate test shot distances

Canon's primary recommendation is to perform AF Microadjustment tests at distances corresponding to those at which you shoot actual subjects with a given lens. An alternative is to shoot test images with the flat, detailed test target approximately 50x the lens' focal length from the camera. Here are what those distances would work out to, at popular focal lengths (distances are approximate):

10mm lens	1.6 feet *(0.5m)*
24mm lens	3.9 feet *(1.2m)*
35mm lens	5.7 feet *(1.7m)*
50mm lens	8.2 feet *(2.5m)*
70mm lens	11.5 feet *(3.5m)*
100mm lens	16.4 feet *(5.0m)*
135mm lens	22.1 feet *(6.7m)*
200mm lens	32.8 feet *(10m)*
300mm lens	49.2 feet *(15m)*
400mm lens	65.6 feet *(20m)*
500mm lens	82 feet *(25m)*

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