

# How to change clip speed and direction

Editors frequently want to change clip speed or direction. With Adobe Premiere Pro, you can edit a video clip so a sprinter starts at double speed, gradually slows down and stops, switches into reverse, starts a backward slow jog, and finishes in a high-speed backward sprint.

Adobe Premiere Pro has three options for changing clip speed or direction:

- *Rate Stretch tool:* Drag the In point or Out point of a clip to stretch or shrink the clip. Stretching a clip slows motion for the entire clip. Shrinking speeds things up. If audio is linked to the clip, it also speeds up or slows down, changing pitch accordingly.
- *Speed/Duration:* Change speed and direction for an entire clip. You can reverse the action and maintain audio pitch despite changing audio playback speed.
- *Time Remapping:* Unlike Rate Stretch and Speed/Duration, which apply a constant speed across the entire clip, Time Remapping allows you to use keyframes to vary the speed throughout the clip and to ease in or ease out of speed changes. Audio remains linked to the video clip but does not change speed nor does it synchronize to the changed video clip speed.

## Using the Rate Stretch tool

To complete this task you need a single, brief video clip with audio and some action.

To use the *Rate Stretch tool*:

1. Start Adobe Premiere Pro.
2. Import the action clip needed for this task, and drag that clip from the Project panel to the beginning of the Video 1 track on a sequence in the Timeline panel.
3. In the Tools panel, select the Rate Stretch tool (**Figure 1**).
4. In the Timeline panel, drag the Out point of the clip to the right until the clip is about double its original length.

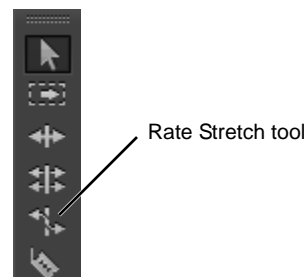
A tool tip tells you how much time you're adding to the clip (**Figure 2**). After you release the mouse button, the clip speed percentage displays next to the clip name (**Figure 3**).

5. Play the clip.

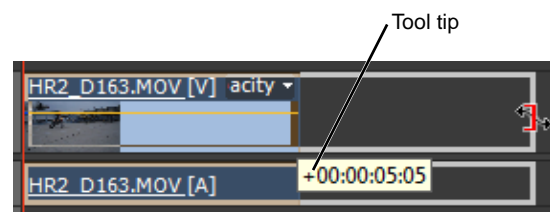
The action in the clip plays at about half the regular speed and the audio has slowed down proportionally.

**Note:** Doubling a clip length cuts its speed down to 50%. Shrinking a clip to half its original size increases its speed to 200%.

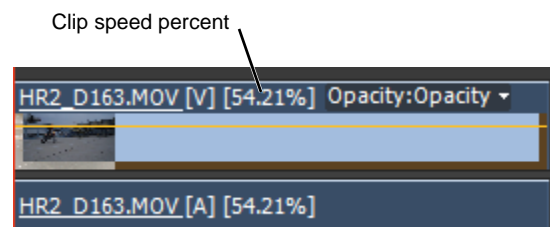
6. Drag the Out point of the clip to the left until the clip is about half its original length.



**Figure 1** Tools panel



**Figure 2** Timeline panel, Rate Stretch tool



**Figure 3** Stretched video clip

## 7. Play the clip.

The action and audio now run at about twice the normal rate.

**Note:** The Rate Stretch tool has no effect if another clip is adjacent to the In point or Out point you want to stretch. In that case, you can move the clip to an empty video track (you need to unlink its audio and move it separately) and use the Rate Stretch tool there. Then select the portion of the clip you want to reinsert in the original video track.

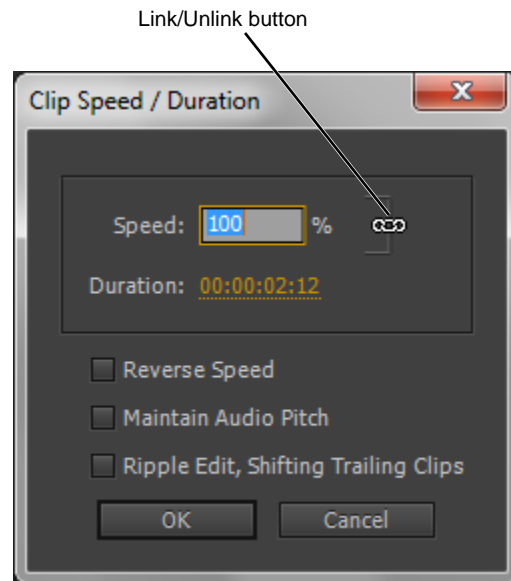
**Note:** The Rate Stretch tool is a very effective way to make a clip fit into a project. You might have a three-second hole you need to fill but the scene you want to put there is a few frames shorter or longer than three seconds. Use the Rate Stretch tool to length or shorten that scene to fill the gap. Viewers are unlikely to notice the subtle speed difference.

To use *Speed/Duration*:

1. In the Tools panel, click the Selection tool and then drag the action clip from the Project panel to the sequence, following the clip you used in the previous task.
2. In the Timeline panel, click the video clip to select it.
3. In the main menu, select Clip > Speed/Duration.

The Clip Speed/Duration dialog box appears (**Figure 4**). You have a few options:

- *Speed*: To double the time, use 200%. For half time, use 50%.
- *Duration*: Instead of a percentage, you can select a specific time. This is a great tool if you want to fill a gap and your clip is not quite long enough. Simply using the Rate Stretch tool doesn't give you the option to maintain audio pitch.
- *Link/Unlink button*: If linked (the default setting), changing the speed changes the length accordingly. If you slow down a clip, you need enough empty space in the video track or audio track to the right of the selected clip for it to expand. Unlinking means the clip retains its original length if you slow it down, but becomes proportionately shorter if you speed it up.
- *Reverse Speed*: The clip's video and audio play backward at whatever speed you set. If you unlink the audio portion of the clip from the video in the sequence before displaying the Speed/Duration dialog box, you can have the audio play normally.
- *Maintain Audio Pitch*: When audio speeds up, it normally sounds like Alvin and the Chipmunks. When it slows down, it's basso profundo. Maintaining the audio pitch means that the audio changes speed but keeps the original pitch. This is an easy way to speed up an announcer's voice to fit his copy into something like an end-of-commercial disclaimer.
- *Ripple Edit, Shifting Trailing Clips*: By default, if you apply slow motion to a clip (a speed value less than 100%), the clip length will not cover or move the next clip. Instead, it will put as much of the clip in slow motion as can fit in its original segment length, and discard the end. If there is some space between the clips, it will expand to fill that space but, again, will not affect the clip to the right. If you select the Ripple Edit, Shifting Trailing Clips option, Adobe Premiere Pro applies the entire effect and shifts any trailing clips to the right in the Timeline to make room for the clip adjustment.



**Figure 4** Clip Speed/Duration dialog box

4. Set 50% in the Speed text box, select Maintain Audio Pitch, and click OK.

The clip lengthens to twice its original duration.

5. Play the modified clip and listen to the realistic (albeit slower) quality of the audio.

**Note:** You can use clip speed changes to make slow-motion music videos, but it takes some pre-production planning. The goal is to create a video in which the singer lip-synchs at normal speed while the video plays in slow motion. To do that:

- a. Create a faster version of the music.
- b. Play the faster-than-normal music while shooting the video to have the singer lip-synch at a faster pace.
- c. In Adobe Premiere Pro, slow down the video to match the beat of the original tune.

It takes some math to get the numbers right. Here's one example: If you speed the music up to 150% of its original speed in Adobe Premiere Pro, you need to slow the video down to 67% ( $100/150$ ) to get the video to synchronize to the original tune.

## Using the Time Remapping video effect

There are two things that make the Time Remapping video effect unique:

- The Effect Controls panel shows no options. You can apply and change speed values in the Velocity Graph of the Effect Controls panel, but that can be tricky. By design, you apply and change Time Remapping keyframes in the Timeline panel.
- You can split a Time Remapping speed keyframe to create a transition between playback speeds. When you first apply a keyframe to a clip, any change in playback speed on either side of a speed keyframe is instantaneous at that frame. When the speed keyframe is dragged apart, the halves form a speed-change transition. You can apply linear or smooth curves to each of those keyframe halves to ease in or ease out the change between playback speeds.

To vary speed with the Time Remapping effect:

1. Drag the action clip from the Project panel to the sequence, after the clips you used in the previous tasks.
2. Make sure the video track is in its expanded mode.

If not, click the Collapse/Expand Track triangle in the track header, to the left of the track name.

3. In the Timeline panel, click the Clip Effect menu and choose Time Remapping > Speed (**Figure 5**).

**Note:** The Clip Effect menu is next to the filename of the clip in the video track. You might have to use the Timeline Zoom In option to make enough room in the clip to display the menu.

4. In the Set Display Style menu, select Show Name Only (**Figure 6**).

The thumbnail of the clip's first frame at the head of the clip (the default setting) disappears, making it easier to work in the Time Remapping effect display.

5. Expand the view of the track by dragging the top of the track name area up.

The Time Remapping effect display appears (**Figure 7**). Here are its features:

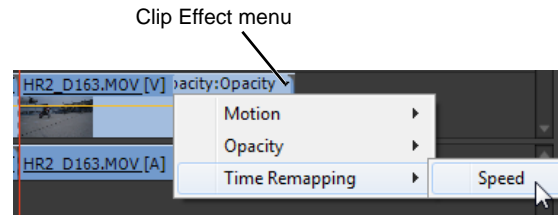
- A horizontal rubber band runs through the center of the clip. You use that to control the speed of the clip.
- The clip is shaded in contrasting colors above and below the 100% speed demarcation.
- A white speed-control track appears in the upper portion of the clip, just below the clip title bar.

6. Ctrl-click (Windows) or Command-click (Mac OS) at a point on the rubber band to set a keyframe.

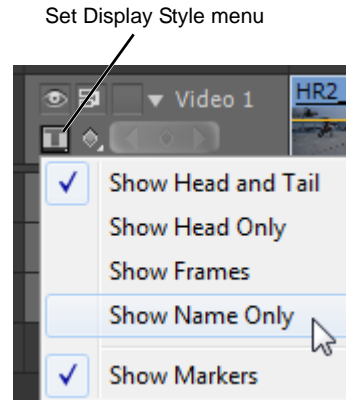
A speed keyframe appears toward the top of the clip in the white speed-control track.

7. Drag the rubber band on either side of the speed keyframe up or down to increase or decrease the playback speed of that segment.

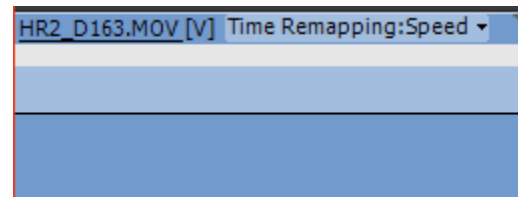
Both the speed and duration of the segment change. Speeding up a segment of a clip makes the segment shorter, and slowing down a segment makes it longer.



**Figure 5** Timeline panel



**Figure 6** Timeline panel



**Figure 7** Time Remapping effect display

8. Drag the left side of the speed keyframe to the left to create a speed transition.

You can drag the right side as well, but for consistency, work only with the left side for this task.

As you drag that keyframe, two things happen:

- The rubber band forms a ramp between the two keyframe halves, indicating a gradual change in speed between them (**Figure 8**).
- The Program Monitor displays a split screen showing the beginning and ending frames of the speed transition (**Figure 9**).

9. After you release the mouse button, click between the two speed-keyframe halves.

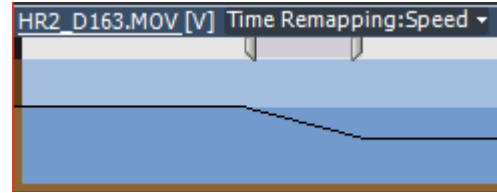
A gray area appears, indicating the length of the transition (**Figure 10**).

A blue line with handles on each end represents the curve control.

10. Drag either handle on the curve control left or right.

**Note:** By default, the speed change is linear. Dragging the handles changes the acceleration or deceleration of the speed change to make it more realistic. The speed change will ease in or ease out according to the curvature of the speed ramp.

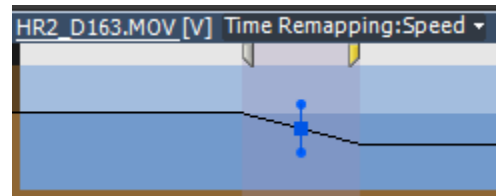
**Note:** The audio portion of the clip remains linked to the video portion but does not change speed.



**Figure 8** Time Remapping effect display



**Figure 9** Program Monitor, Time Remapping speed transition display



**Figure 10** Time Remapping effect display

To use the Time Remapping tool to play a clip backward:

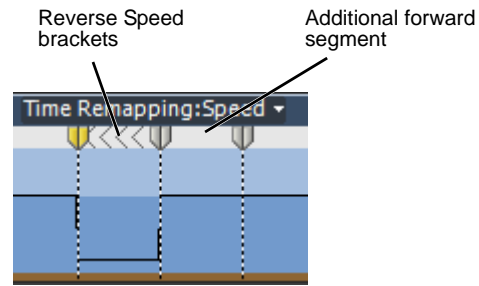
1. Drag the action clip from the Project panel to the sequence, following the clips you used in the previous tasks.
2. Follow steps 2–6 in the previous task to apply a Time Remapping keyframe at the location where you want the clip to start playing in reverse.
3. Ctrl-drag (Windows) or Command-drag (Mac OS) the speed keyframe (both halves) to the place where you want the backward motion to end (you can only drag it to the right).

Four things happen:

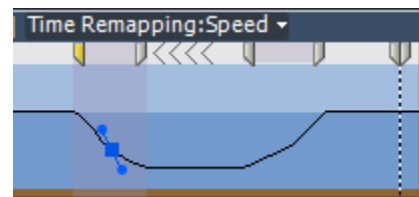
- A tool tip shows the speed as a negative percentage of the original speed.
- The Program monitor displays a split screen showing the static frame where you initiated the drag and a dynamically updating frame that the reverse playback will return to before switching to forward speed.
- When you release the mouse button to end the drag, an additional segment of the same duration as the segment you just created is added for the forward playback portion, and an additional speed keyframe is placed at this second segment's end (**Figure 11**).
- Left-pointing angle brackets appear in the speed control track, indicating the section of the clip playing in reverse (**Figure 11**).

The segment plays backward at full speed from the first keyframe to the second and then forward at full speed from the second to the third keyframe, returning to the frame at which the backward motion began. This is called a *palindrome reverse*.

4. Drag the speed control rubber band up or down to change the reverse speed.
5. Drag the halves of the first two sets of keyframes to create a transition (**Figure 12**).
6. Drag the curve control handles of those two transitions to make the change from forward to reverse and back to forward look less abrupt (**Figure 12**).



**Figure 11** Time Remapping reverse effect display



**Figure 12** Time Remapping curve controls and handles

To use the Time Remapping tool to freeze a portion of a clip:

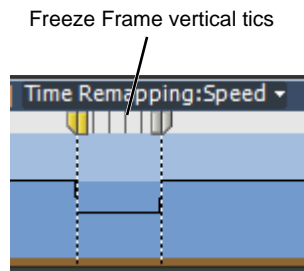
1. Drag the action clip from the Project panel to the sequence, following the clips you used in the previous tasks.
2. Follow steps 2–6 in the “To vary speed” task to apply a Time Remapping keyframe at the location in the clip where you want the freeze frame to begin.
3. Ctrl-Alt-drag (Windows) or Command-Option-drag (Mac OS) the speed keyframe to the place where you want the freeze frame to end (you can only drag to the right).

Four things happen (**Figure 13**):

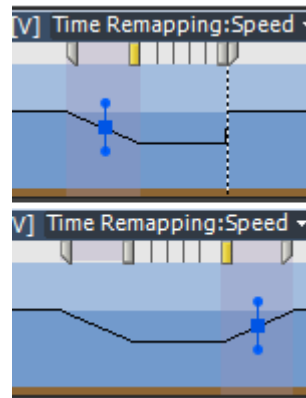
- The Time Remapping rubberband gets lower between the two halves of the keyframe.
  - A second keyframe appears at the place where you dragged the keyframe.
  - The inner half-keyframes take on a rectangular appearance as compared with regular speed keyframes.
  - Vertical tic marks appear in the speed control track to indicate the segment of the clip playing freeze frames.
4. Drag the left half of the speed keyframe on the left to the left, or the right half of the speed keyframe on the right to the right.

That creates speed transitions to or from the freeze frame (**Figure 14**).

5. Click either gray area between keyframe halves to display a curve control. Drag the control’s handles to change the acceleration or deceleration of the speed change.



**Figure 13** Time Remapping freeze frame effect display



**Figure 14** Time Remapping freeze frame speed transitions