

Rock Climbing: Indoor Top-Roping Belay Method

Background:

One of the most popular forms of rock climbing is top-roping at an indoor gym. This method of gym climbing involves two people, a climber and a belayer. Both must know how to properly put on a harness and implement simple safety checks. The climber must know how to tie the retraced figure 8 knot, considered prior knowledge for top roping and communicate their climbing progress with the belayer. The belayer must know how to load a belay device and how to use “PBUS” belaying technique. With practice elements of this procedure can be done very quickly, however, if done wrong it could lead to serious injury and in some cases possibly death. All gyms should test each climber on their ability to tie the retraced figure 8 knot before letting them climb.

Equipment:

-Dry Rope (length depends on height of route being climbed)**	
-Pulley System **	
-2 properly fitting climbing harnesses	
-Belay Device	
-Locking Carabiner	

Figure 1: Equipment needed for top-roping.

**Often Provided by climbing gym and do not need to be provided by climbers.

Procedure:

Harness Preparation:

1. Check the harness for any visible rips or damage, if there are any do **NOT** use the harness.
2. Put harness on similar as one would put on a pair of pants with the belay loop in the front.
 - a. Make sure all straps are not twisted and that the leg loops are not inverted or twisted as well.
3. Tighten all buckles so that they are snug but not too tight.

Climber:

1. Take the end of the rope closest to the wall (assuming the rope has already been placed as in most gyms) have the end of the rope in the right hand and extend it out all the way, grab the rope with your left hand close to the body.
 - a. The pose should be like that of an archer with an arrow knocked.
2. The climber should then tie the figure 8 knot
 - a. Follow this YouTube tutorial on how to tie the retraced figure 8 knot (<https://www.youtube.com/watch?v=tFffbKXSgNI>)
3. After the first figure 8 is tied thread the rope through the tie-in loops. Go through the bottom first and then the top.
4. Retrace the original figure 8 knot with the rest of the rope and then pull tight.
5. Check to make sure that there are 5 sets of parallel lines in the knot.



Figure 2: What a proper retraced figure 8 knot should look like

Belayer:

1. Take the end of rope further from the wall and make a small loop, push the loop into the belay device's rope slots so that the end of the rope is on the side of the belay device that is jagged (the breaking grooves), and then end of the rope that goes upwards towards the pulley is on the side that has a small pictogram of a climber.
2. Unlock the carabiner by either twisting the lock or unscrewing it (depending on what type of locking mechanism it has) and loop it through the belay device's cable and the loop of rope that has been loaded into the belay device in **Step 1**.
3. Also loop the carabiner through the belay loop on the belayer's harness and then lock the carabiner by whichever mechanism it uses (twist or screw).

4. Check the climber's knot for the 5 sets of parallel lines as shown in **Figure 2** and have the climber check your belay device to make sure it is loaded properly, and that the carabiner is locked.



Figure 3: Properly loaded belay device. The carabiner would also be connected through belay loop on harness.

Proper Belay and Climbing Technique:

1. The climber and belayer should each check each other's knots and belay devices.
 2. The climber and belayer should check with each other before the climber begins their route to ensure that the belayer is ready.
 3. As the climber ascends and puts slack in the rope the belayer should employ the PBUS (Pull, Break, Under, Slide) method with their dominant hand on rope 2 pointing down in **Figure 3** and their non-dominant hand on the rope 1 pointing up in **Figure 3**.
 - a. Pull: The belayer should pull down on the rope 1 with their non-dominant hand and on rope 2 with their dominant hand simultaneously.
 - b. Break: Pull rope 2 towards the belayer's body with the dominant hand adding force between the rope and the breaking grooves. This adds a lot of friction so that the rope can't slip.
 - c. Under: Now that the rope is locked in place, remove the non-dominant hand from rope 1 and place it under the dominant hand on rope 2
 - d. Slide: Slide the dominant hand up rope 2 back up to its starting position just below the belay device on rope 2. Next, bring the non-dominant hand back to its original position on rope 1 and repeat.
- *It is important to note that with the PBUS technique there is **ALWAYS** a hand in contact with rope 2.

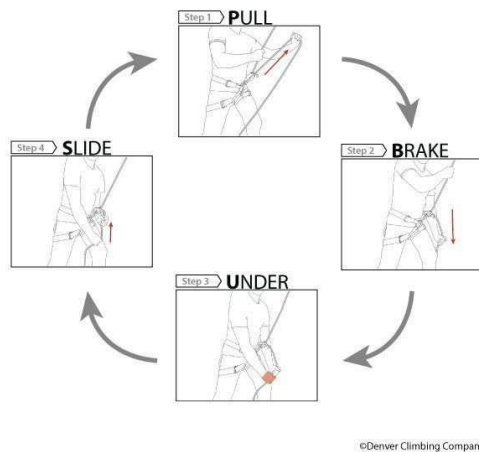


Figure 4: Proper belaying technique, also known as PBUS technique.

4. If the climber falls or reaches the top of the route and is ready to come down, the belayer should do the break step immediately. Then, they should relieve the friction in the rope gradually and slowly so that the climber comes down the wall in a slow and controlled manner.
5. The climber and belayer should untie the figure 8 knot and unload the belay device and then return the rope to the way in which it was found.

Appendix A:



Figure 5: Anatomy of a climbing harness



Figure 6: Parts of a belay device