

## Chapter 12: Load-releasing Methods

**Scope:** This chapter serves as an introduction to loading-releasing methods.

**Terminal Learning Objective (TLO):** At the end of this chapter, the student will be aware of the most common difficulties encountered involving prusik brakes and provide functional solutions for these situations.

**Enabling Learning Objectives (ELO):**

1. Describe load-releasing methods
2. Demonstrate how to construct and operate a load-releasing device during rappelling, lowering, or raising operations

Most low angle rope rescue operations involving properly trained personnel will be smooth and trouble free. Teams may encounter operational challenges involving the prusik hitches employed as brakes through the rope rescue system. This chapter will outline the most common difficulties encountered involving prusik brakes and provide functional solutions for these situations. Often the simplest solution will be to have the rescuers lean or move uphill, slacking the problem line. However, this technique is not always practical and the specific approach should be chosen based on the needs of the scenario. Teams are likely to encounter challenges involving prusik brakes during the following operations.

- Rappelling operations.
  - Tandem prusik brake set on the belay/safety line.
- Lowering operations.
  - Tandem prusik brake set on the belay/safety line.
- Raising operations.
  - Load jammed against an obstacle, prusik brake set on the belay/safety line and main line brake.

### Rappelling or Lowering Operations

During rappelling or lowering operations, the tandem prusik brake may be unintentionally set on the belay/safety line. If this occurs, there are two recommended techniques that can be employed in order to release the brake. The main line can be secured at the rescuer's DCD (rappelling) or main line anchor (lowering) and the line can be "vectored" or a "Z-rig" can be constructed in the belay/safety line in order to release the set brake.

### Load Releasing Using the Vector Method

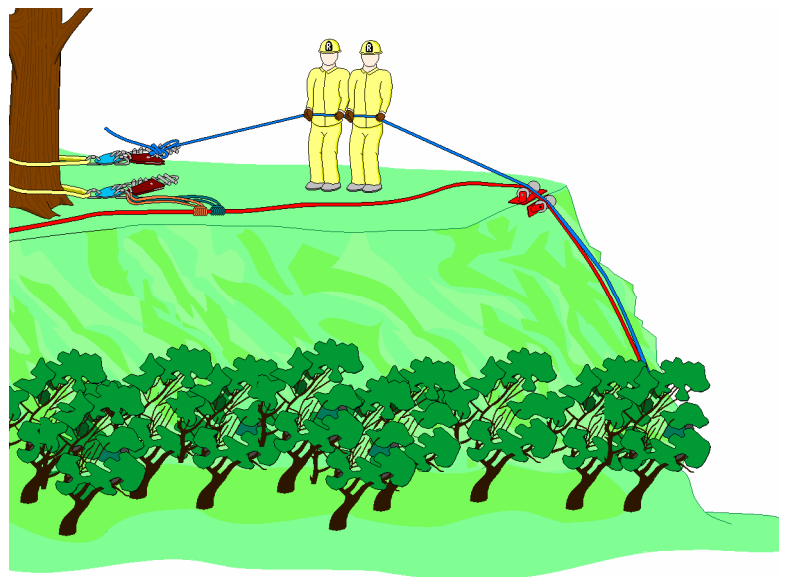


Figure 12-1: Vector

Rescuer(s) grasp a section of the lifeline that is secured between the load and the anchor. The lifeline is lifted as shown in Figure 12-1. The load is raised, creating slack in the belay/safety line and allowing the Tender to release the set prusiks.

1. Rescue Group Supervisor calls, "All stop."
2. Secure the main line at the rescuer's DCD as needed (rescuer or main line anchor).
  - Lock off the DCD as shown in Chapter 10.
  - Rescuer (rappelling) or Main Line Tender (lowering) maintains tension at the DCD.
3. "Vector" the main line to provide adequate slack in the belay/safety line.
4. Release the prusik brake. (Figure 12-2)

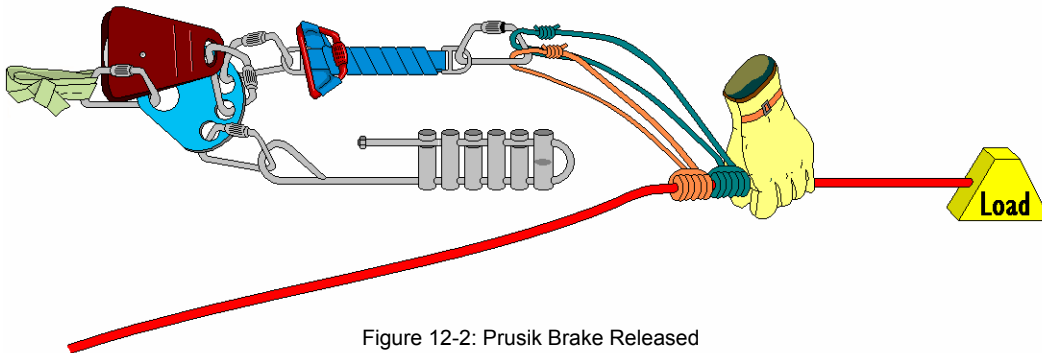


Figure 12-2: Prusik Brake Released

5. Release the "vector" slowly.
6. Unlock the DCD (rescuer or main line anchor) if it was locked off in Step 2.
7. Resume the operation.

## Load Releasing Using the Z-rig Method

1. Rescue Group Supervisor calls "All stop."
2. Secure the main line at the DCD (rescuer or main line anchor).
  - Lock off the DCD as shown in Chapter 10.
  - Rescuer (rappelling) or Main Line Tender (lowering) maintains tension at the DCD.
3. Reeve the belay/safety line in the change of direction pulley at the rigging plate. (Figure 12-3)

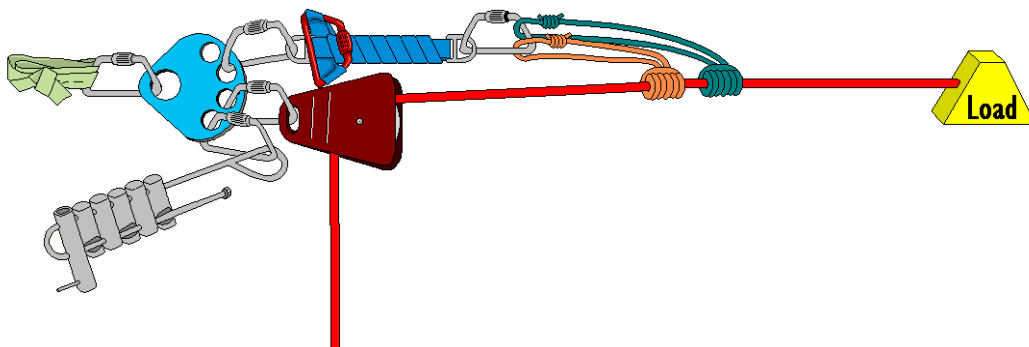


Figure 12-3: Reeve the Belay/Safety Line

4. Form a three-wrap prusik on the belay/safety line on the load side of the tandem prusik brake. (Figure 12-4)

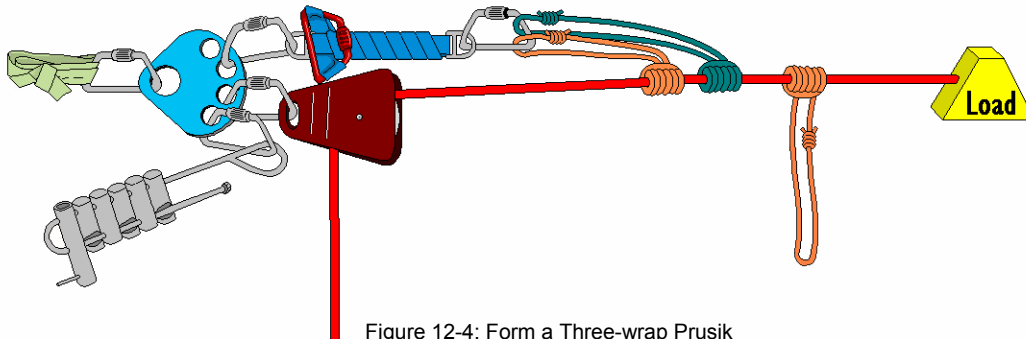


Figure 12-4: Form a Three-wrap Prusik

5. Attach a carabiner through the prusik hitch and clip the belay/safety line into the carabiner. (Figure 12-5)

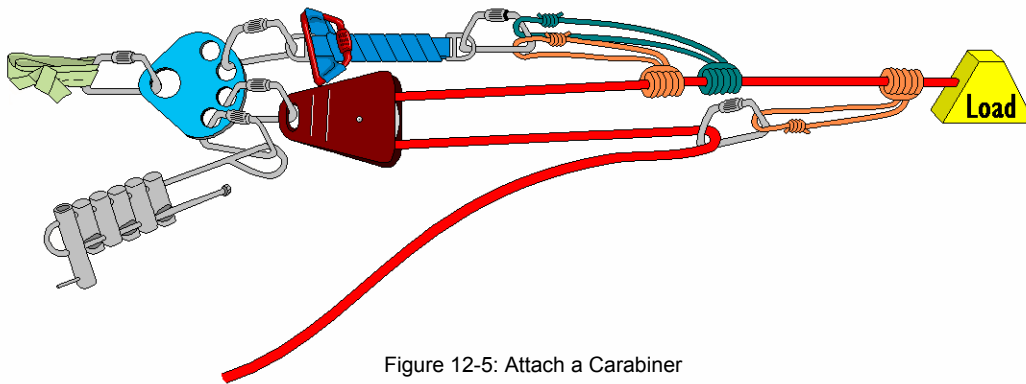


Figure 12-5: Attach a Carabiner

6. Rescue Group Supervisor assembles the necessary personnel to tension the belay/safety line.
7. Under the direction of the Rescue Group Supervisor, tension the belay/safety line to provide adequate slack in order to clear the jammed prusik brake.

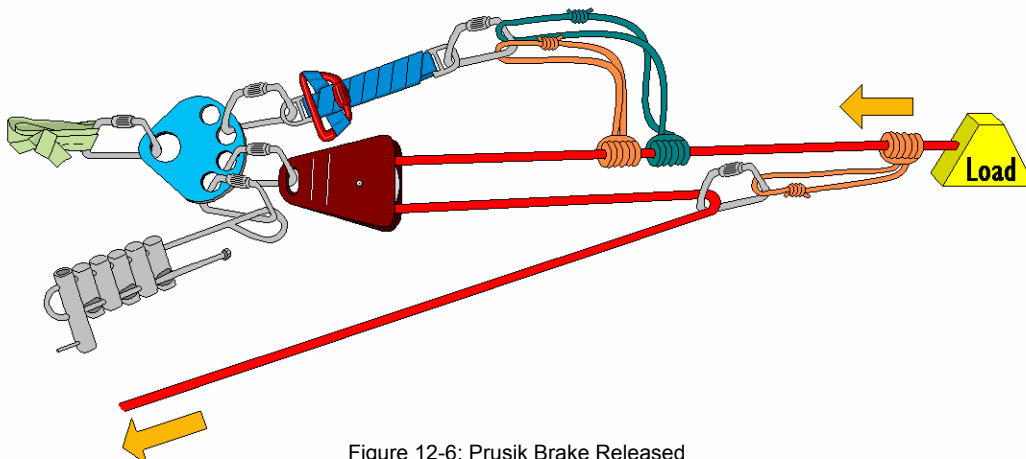


Figure 12-6: Prusik Brake Released

8. Release the prusik brake. (Figure 12-6)
9. Remove the Z-rig.
10. Unlock the DCD (rescuer or main line anchor) if it was locked off in Step 2.
11. Resume the operation.

## **Raising Operations**

During most raising operations, unintentionally locked prusiks will not create a challenge. The exception occurs when the rescue litter being raised becomes jammed against an obstacle and prusik brakes are unintentionally locked on both the main line and the belay/safety line. The primary piece of equipment used to mitigate these situations is the load-releasing device (LRD). The rescuer, therefore, must know how to construct and operate a LRD.

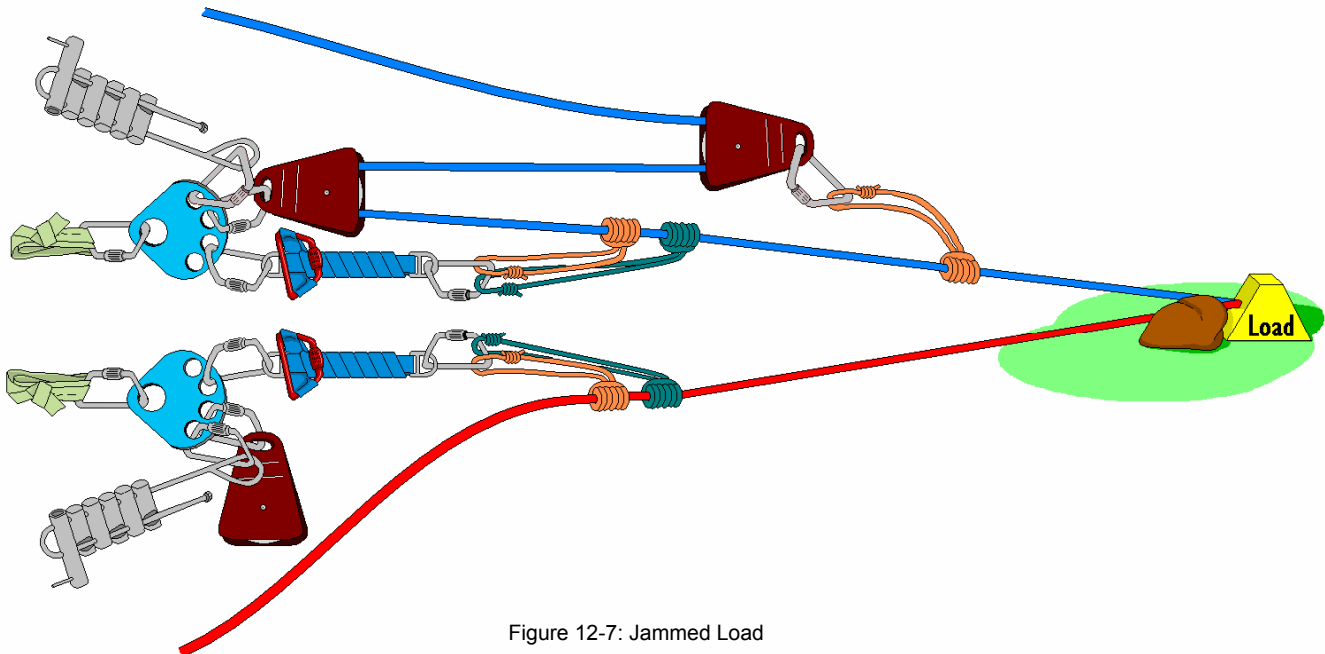
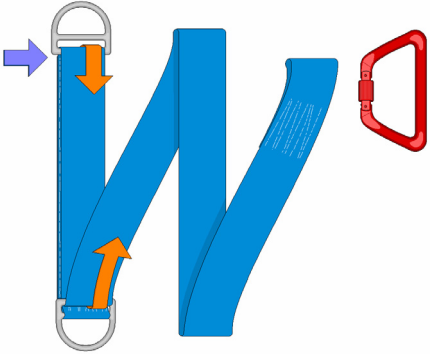
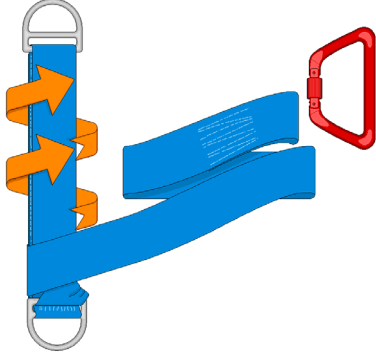
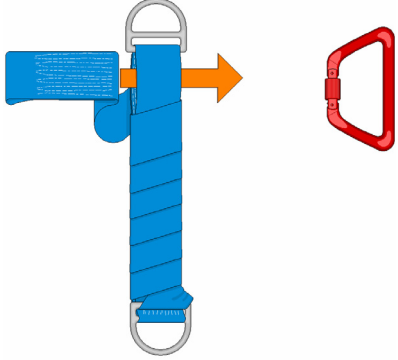
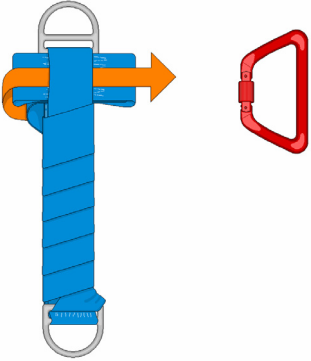
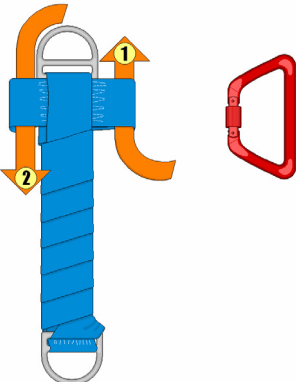
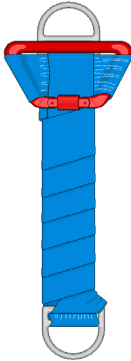


Figure 12-7: Jammed Load

## LRD Set-up (CMC ProSeries Load Release Strap)

The instructions below apply to the CMC ProSeries Load Release Strap only. Teams using other manufacturer's equipment must refer to specific manufacturer's information for safe set-up and use.

<p>Figure 12-8: Step 1</p>  <ol style="list-style-type: none"> <li>1. Pull the end of the strap until the floating D-ring is close to the end of the stitched section of the webbing.</li> </ol>	<p>Figure 12-9: Step 2</p>  <ol style="list-style-type: none"> <li>2. Wrap the webbing around itself until about 8" of webbing is left.</li> </ol>	<p>Figure 12-10: Step 3</p>  <ol style="list-style-type: none"> <li>3. Form a bight near the stitched section at the end of the strap.</li> </ol>
<p>Figure 12-11: Step 4</p>  <ol style="list-style-type: none"> <li>4. Pass the bight through the strap as shown.</li> </ol>	<p>Figure 12-12: Step 5</p>  <ol style="list-style-type: none"> <li>5. Connect the bight and the stitched loop together with a carabiner.</li> </ol>	<p>Figure 12-13: Step 6</p>  <ol style="list-style-type: none"> <li>6. Finished LRD.</li> </ol>

## LRD Load Transfer

- ☐ Maintain control of the stitched loop at all times during load transfer.
  - Remove the carabiner that connects the stitched loop and the bight.
  - Pull the bight out of the LRD.
  - Slowly remove the wraps until the strap begins to slip.
  - Control movement until the load is transferred.

## Load Releasing Using the LRD

1. Rescue Group Supervisor calls, "All stop."
2. Belay/safety line.
  - Ensure the main line is secure and prusik(s) are set

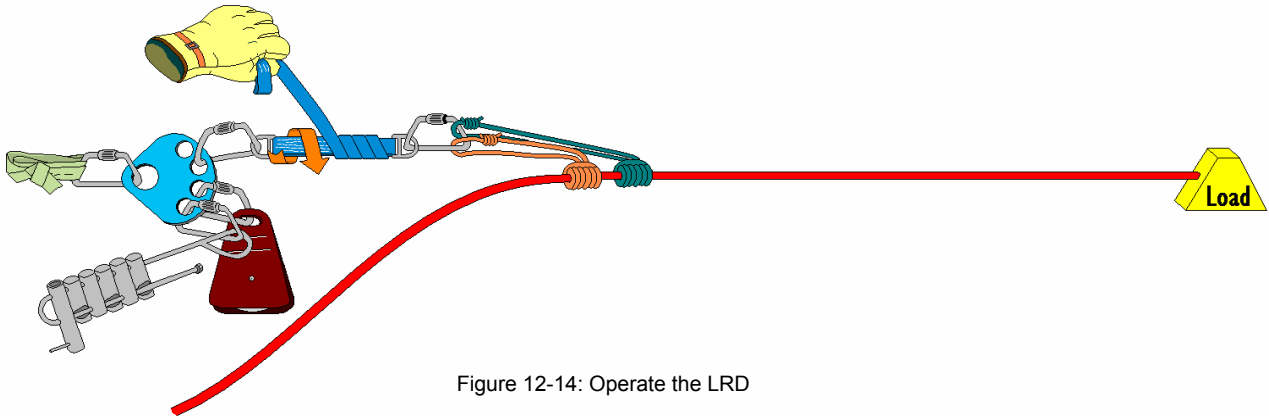


Figure 12-14: Operate the LRD

- Transfer the load from the belay/safety line to the main line according to manufacturer's instructions. (Figure 12-15)

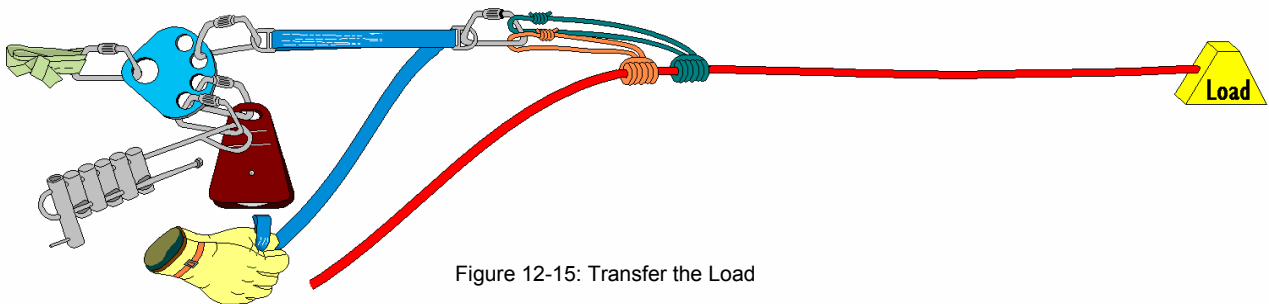


Figure 12-15: Transfer the Load

- Loosen and reposition the prusiks on the belay/safety line.
- Reconstruct or replace the LRD according to manufacturer's instructions. (Figure 12-16)

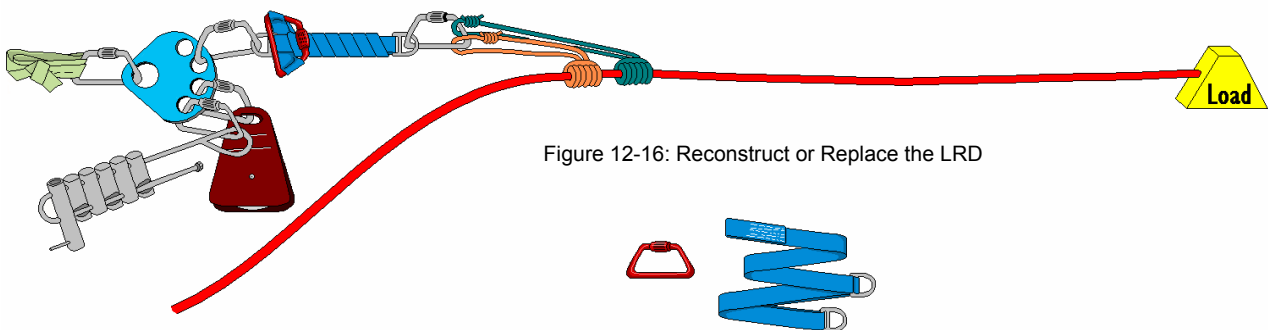


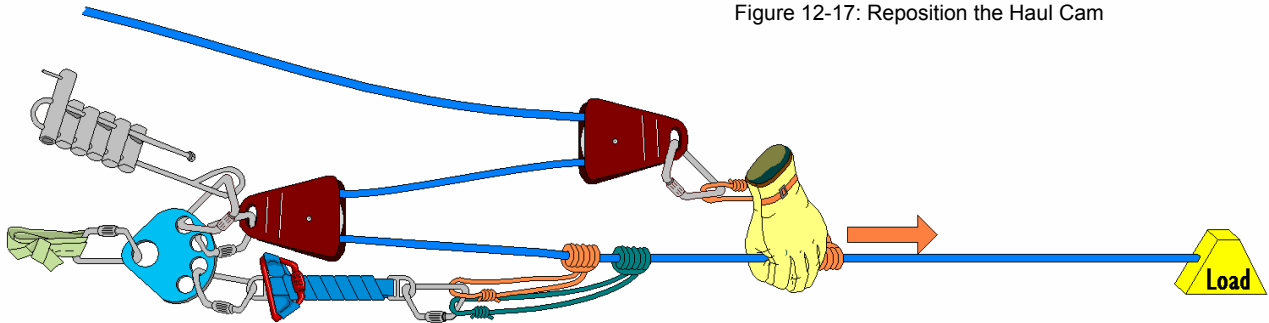
Figure 12-16: Reconstruct or Replace the LRD

- SAFETY CHECK.
- Tend the belay/safety system while clearing the main line.

### 3. Main line.

- Reposition the haul cam as needed to clear the change of direction (COD) pulley. (Figure 12-

Figure 12-17: Reposition the Haul Cam



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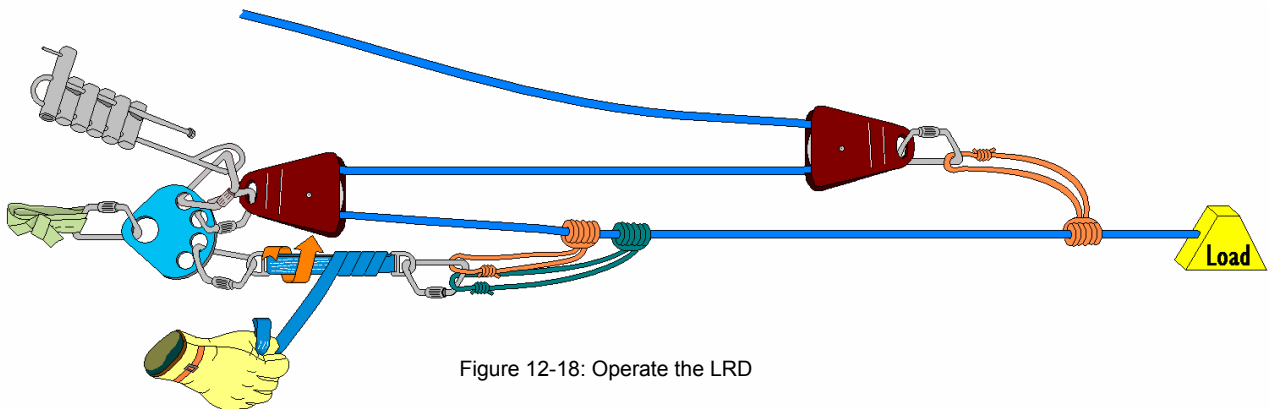


Figure 12-18: Operate the LRD

- Haul Team staffs the main line and maintains tension during the LRD operation.

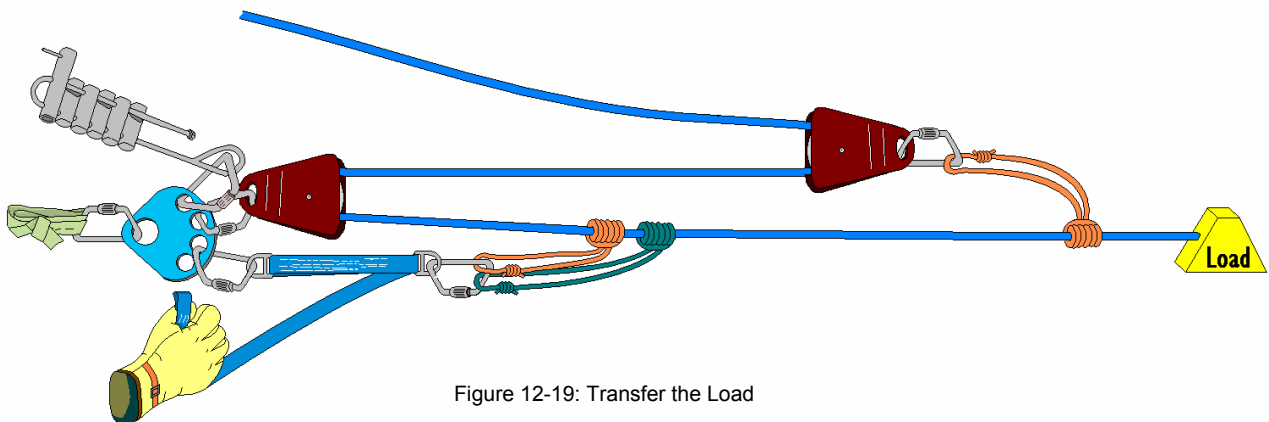


Figure 12-19: Transfer the Load

- Transfer the load according to manufacturer's instructions. (Figure 12-19)

- Loosen and reposition the prusiks.
- Reconstruct or replace the LRD according to manufacturer's instructions. (Figure 12-20)

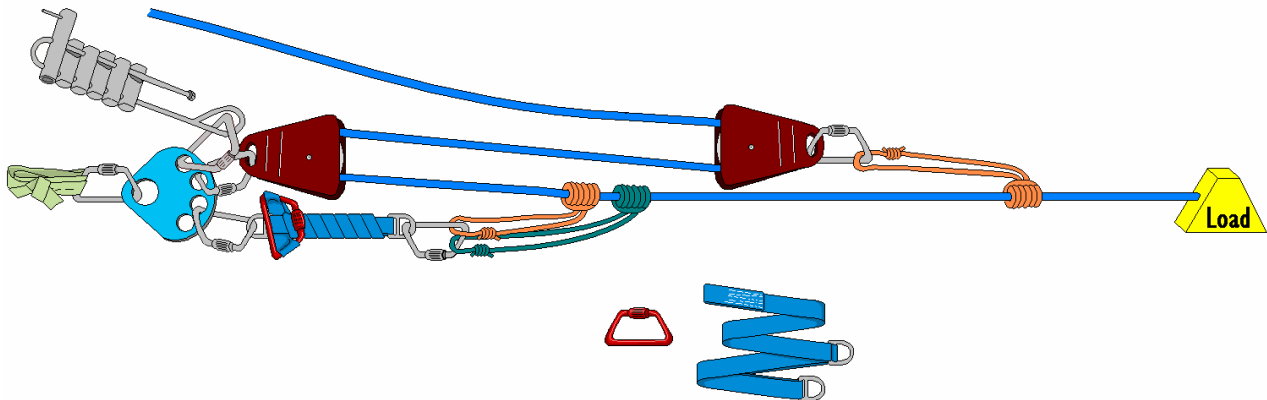


Figure 12-20: Reconstruct or Replace the LRD

- Haul Team lowers the load through the MA system while tending the prusiks, as needed to clear the obstacle.
- Set the prusik brake and conduct a safety check.
- Resume normal raising operations.