INSTRUCTOR GUIDE

TOPIC: VICTIM REMOVAL

LEVEL OF INSTRUCTION:

TIME REQUIRED: THREE HOURS

MATERIALS: GROUND LADDERS, BLANKETS, STOKES BASKETS, WEBBING, HARNESSES, CARABINERS, FIGURE EIGHTS, ASCENDERS, PULLEYS, PRUSSIC CORDS, SLINGS, BLOCKS, ROPE, REEVES SLEEVE, PICKETS, SLDEGE HAMMER, BASKET HARNESS, AERIAL APPARATUS

REFERENCES: RESCUE TECHNICIAN, MARYLAND FIRE AND RESCUE INSTITUTE, MOSBY; TECHNICAL RESCUE RIGGERS GUIDE, RICK LIPKE, MOUNTAIN RESCUE ASSOCIATION; AERIAL APPARATUS DRIVER/OPERATOR HANDBOOK, IFSTA

PREPARATION:

MOTIVATION: There may be occasions when the victim is found in an area above or below the ground level and equipment and apparatus not normally used for that purpose have to be placed in service. It is important that firefighters know how to use the techniques and equipment to facilitate the rescue.

OBJECTIVE (SPO):

The student will demonstrate a basic understanding of removing packaged victims using ladders and mechanical advantage systems through participation in class discussion and practical activities.

OVERVIEW:

**Victim Removal**
- Ladder Rescue Systems
- Vertical Lowering Techniques
- Overland Victim Removal
  * Practical Activity
VICTIM REMOVAL

SPO: The student will demonstrate a basic understanding of removing packaged victims using ladders and mechanical advantage systems through participation in class discussion and practical activities.

EO 1-1 Demonstrate a knowledge of ladder systems used in rescue to raise or lower victims.

EO 1-2 Demonstrate a knowledge of vertical lowering techniques used to remove victims from above or below ground.

EO 1-3 Demonstrate a knowledge of the techniques used to raise and lower a victim overland.

EO 1-4 Demonstrate an understanding of victim removal systems by constructing ladder raising and lowering systems and moving a victim overland.
NOTE: Instructor should review each skill with students who will have an opportunity to demonstrate proficiency during the practical portion of the session. The instructor may also need to review basic knots used in rescue, mechanical advantage systems, and ladder lifts, carries, and raises.

I. LADDER RESCUE SYSTEMS (1-1)

A. Ladder Gin

1. Lay the ladder on the ground
2. Select the two ropes to be used for support and guy lines
3. Form a figure eight on a bight in the middle of each rope
4. Attach a knot to each beam at the tip by going under the top rung and over the tip (one end of the rope on each side is used for hoisting/support and the other is used as a guy line)
5. Place the ladder heel on the rear step of the pumper using cribbing to protect the step
6. Attach a sling around the beams of the ladder with the ends passing over a rung, connect the two bights together with a carabiner, placed the rope through the opening in the pulley, and attach the pulley to the carabiner
7. Stretch the support lines out and raise the ladder to about 90 degrees
8. Secure the support lines to steamer connections on the pump
9. Secure the guy lines to the railings on the rear of the pumper
10. Form a loop in a piece of webbing and place it around one of the tow hooks on the back of the pumper
11. Place the lifting rope through a pulley and attach it to the webbing around the tow hook using a carabiner (change of direction pulley)
12. Test strength of system by pulling on the rope and observing angle of ladder which should not be below 75 degrees
13. Construct a mechanical advantage system to lift the load
14. Check all knots and carabiners to make sure they are secured

B. Ladder Sheerlegs

1. Lay the two ladders to be used side by side with tips even (or as even as possible)
2. Select the two ropes to be used for guy lines
3. Form figure eight on a bight in middle of each rope
4. Attach a knot to each beam at the tip by going under the top rung and over the beams of both ladders
5. Stretch out the guy lines to determine the location of pickets (two on each side) which are angled off to the tip of ladder and approximately the distance of the used length of the ladder and driven into ground 2/3 of length and 90-degree angle of the lines
6. Attach a sling to tip of ladder using both sets of beams by going around the beams with the ends dropping between the two sets of rungs
7. Connect two bights with a carabiner
8. Place the lifting rope through a pulley and attach it to the carabiner
9. Heal the ladder and raise it
10. Secure the heels of the ladder with pickets and rope (two for each side)
11. Test the strength of the system by pulling on the rope and observing the angle of
   the ladders (if it drops below 70 degrees, there is a possibility that the sheerlegs
   will collapse under a load)
12. Using webbing formed in a loop, attach a carabiner to the bottom rung on one
   side of the ladder
13. Pass the rope through a pulley and attach it to the carabiner (change of direction
   pulley)
14. Construct a mechanical advantage system to lift the load
15. Check all knots, pickets, slings, and carabiners to make sure they are secure

C. Aerial Ladder

   1. Can be used as an elevated anchor point or lowering device
   2. Victim can be carried or sled down ladder

D. Elevated Platform

   1. Can be used as an elevated anchor point
   2. Victim can be carried in basket

II. VERTICAL LOWERING TECHNIQUES (1-2)

   NOTE: For any patient movement that involves above or below ground operations,
   plastic stokes baskets should not be used. Eye protection as well as other necessary
   protective measure should be taken for the victim.

A. Ladder Systems

   1. Ladder slide

      a. Raise ladder with no more than one rung above window or roof edge
         and secure at tip if possible
      b. Prepare basket, SKED, or reeves sleeve for vertical lowering
      c. Connect lowering line to a mechanical advantage system or descent
         control device if needed
      d. Place a second rescuer on the ladder to receive the victim
      e. Place the basket, SKED, or reeves sleeve on the ladder
      f. Lower the victim slowly watching to make sure that the packing device
         does not get caught on the ladder rungs
      g. If an aerial ladder is used, short poles can be placed on the ladder rails
         and the basket allowed to slide on them
2. Ladder gin
   a. Construct a ladder gin as described previously
   b. Prepare the basket, SKED, or reeves sleeve for horizontal lowering
   c. Attach a mechanical advantage system
   d. Raise or lower the victim slowly
   e. Once the victim is at ground level, pull the packaging device to one side as the rope system is being lowered

3. Ladder sheerlegs
   a. Construct ladder sheerlegs as described previously
   b. Prepare the basket, SKED, or reeves sleeve for horizontal lowering
   c. Attach a mechanical advantage system
   d. Lower victim slowly
   e. Once the victim is out of the opening, pull the packaging device to one side as the rope system is being lowered

4. Aerial device fixed anchor point
   a. Attach a sling or piece of webbing in a loop to the ladder by going around the beams with ends passing over a rung
   b. Connect the two bights using a carabiner
   c. Pass the rope through a pulley and attach the pulley to the carabiner
   d. Attach a sling or piece of webbing in a loop to a rung near the bottom of the ladder on the underside
   e. Pass the rope through a pulley and connect the pulley to the sling/loop (change of direction pulley)
   f. Construct a mechanical advantage system

5. Aerial ladder moveable anchor
   a. Place a hose or rope roller over tip of ladder and secure it
   b. Pass the rope over the roller and down the ladder to the turntable
   c. Attach a piece of webbing in a loop or a sling to the bottom rung
   d. Attach a carabiner to the webbing
   e. Pass the rope through a figure eight and connect the figure eight to the carabiner (this allows the rope to be adjusted easily)
   f. Remove all slack from the rope
   g. Extend and retract the ladder as needed to raise or lower the victim
   h. Rotate the turntable as needed

6. Elevated/articulated platform
a. Attach a sling or piece of webbing in a loop to the underside of the platform using eyes that should be there
b. Connect the two bights together using a carabiner
c. Pass the rope through the pulley and connect the pulley to the bights using a carabiner
d. Attach a sling or piece of webbing in a loop near the turntable
e. Pass the rope through a pulley and attach the pulley to the sling or piece of webbing using a carabiner (change of direction)
f. Construct a mechanical advantage system

III. OVERLAND VICTIM REMOVAL (1-3)

A. Simple system
   1. Used for a very minor slope
   2. Form a sling or piece of webbing in a loop around an anchor point
   3. Pass the rope through a pulley and connect the pulley to the sling or webbing using a carabiner
   4. Have personnel pull on the rope
   5. Four to six rescuers can be attached to the rail

B. Z-rig
   1. Identify two anchor points close together
   2. Place a sling or piece of webbing in a loop around each
   3. Pass a rope for each anchor through a figure eight
   4. Attach the figure to the sling or webbing using a carabiner
   5. Attach a prussic cord to each rope
   6. Connect the prussic cord to the carabiner that is holding the figure eight
   7. Rescuers can be lowered using figure eights (they should be wearing Class III harnesses)
   8. Connect the rope to the packaging device
   9. Engage the prussic cord, remove the figure eights and replace them with pulleys
   10. Construct a Z-rig system on each lowering line
   11. Use the Z-rig systems to raise the victim and rescuers (you may only need to use one Z-rig for this)
   12. Basket can be pulled up by sliding it on the surface or four to six rescuers can be attached to the rail and carry it with the mechanical advantage system providing additional assistance

C. Piggyback System
   1. Would be used in conjunction with the simple system when the load is too heavy or the slope is too steep for the simple system
   2. Identify two anchor points close together
3. Secure the rope being used for the simple system to one
4. Place a sling or piece of webbing in a loop around each
5. Pass a rope for each anchor through a figure eight
6. Attach the figure to the sling or webbing using a carabiner
7. Attach a prussic cord to each rope
8. Connect the prussic cord to the carabiner that is holding the figure eight
9. Rescuers can be lowered using figure eights (they should be wearing Class III harnesses)
10. Engage the prussic cord, remove the figure eights and replace them with pulleys
11. Construct a Z-rig system on each lowering line
12. Attach one of the ropes from the Z-rig to the original hauling rope (the other may be used to raise the rescuers if they are not used to carry the patient)
13. Use the piggyback system to raise the victim and rescuers
14. Basket can be pulled up by sliding it on the surface or four to six rescuers can be attached to the rail and carry it with the mechanical advantage system providing additional assistance

IV. PRACTICAL ACTIVITY (1-4)

A. Set up four practical skills stations with an evaluator at each station to observe skills proficiency. Divide class evenly into groups. Allow no more than thirty minutes for each group at each station.

B. Station 1 - Vertical lower

1. Have the students, working as a group, package the "victim" in a stokes basket, SKED, or reeves sleeve and lower vertically using a ground ladder
2. A descent control device should be used for safety

C. Station 2 - Ladder gin

1. Have the students construct a ladder gin
2. Package the "victim" in a stokes basket, SKED, or reeves sleeve
3. Construct and operate a Z-rig mechanical advantage system

D. Station 3 - Ladder sheerlegs

1. Have the students construct a ladder sheerlegs
2. Package "victim" in a harness
3. Construct and operate a Z-rig mechanical advantage system

E. Station 4 - Overland system

1. Have students construct two descent controlled lowering lines
2. Lower the rescuers and equipment to the "victim"
3. Package "victim" in stokes basket, SKED< or reeves sleeve
4. Attach the victim to lowering line and prepare for raising
5. Replace the figure eight with a pulley and piggyback mechanical advantage system
6. Raise "victim" and rescuers

Optional: Aerial device vertical and/or horizontal raise and lower if equipment is available.

NOTE: All students are expected to perform all the practical skills to the satisfaction of the evaluators. Assistance should be provided when required.
REVIEW:

Victim Removal
  * Ladder Rescue Systems
  * Vertical Lowering Techniques
  * Overland Victim Removal
  * Practical Activity

REMOVATION: While these techniques are not used on a regular basis, they may be needed for rescue from a confined space, removal of an injured victim from a roof, or during a silo rescue. Regular practice will improve proficiency when called upon to used the skills.

ASSIGNMENT:

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EVALUATION:

All students are expected to perform all the practical skills to the satisfaction of the evaluators. Assistance should be provided when required.