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Rescue Techniques

Section 1 Introduction

Firefighters must carry out rescues as the result of natural disasters, work-related accidents and a wide range of other general incidents. The rescue equipment/materials and methods used in rescue efforts will naturally differ according to the type of incident or accident and the particular circumstances.

Therefore, when a rescue is required, one must accurately assess the type of emergency, its scale, location, surrounding conditions, the condition of persons needing rescue and other aspects of the situation. One must estimate the materials, equipment and staff needed, and use the most appropriate means to safely, surely and quickly perform the rescue. Rescue methods will also differ according to the location of the emergency, so pay attention to the position-based conditions presented in this chapter, which are divided into high areas, low areas and level areas, with different types of rescues presented for these situations. The types and amounts of materials and equipment to use for each rescue have been kept to a minimum here for general items. Depending on the actual emergency, it will be necessary to select equipment/materials and increase or decrease amounts.

Section 2 Rescue from High Places

Emergency situations requiring rescue from a high place may include people trapped in a fire, someone who has fallen at a construction site or on the outside of a building, or someone who has received an electrical shock while suspended from a rope or atop a pole. In all cases, rescue efforts incur the risk of secondary injury to the firefighter and obstructions to rescue efforts. These include the danger of falling, unstable footing, fear and difficulty in reaching victim.

The method of entry to the scene of the incident and methods of rescue and removal will vary according to the actual circumstances, but it is always important to use the safest, surest means, including equipment available at the scene or firefighting equipment such as aerial ladder trucks and elevating platform. The machinery and equipment available to firefighting rescue squads have been improving, but are not fully satisfactory. It is necessary to understand that the rescue techniques described here in which a ladder or other equipment is used is just one way to assist in the rescue of people from high places.

1. Emergency Ladder Rescue

(1) Objective

To safely and rapidly rescue a person from a high place using a ladder leaned against a building and a rope slung over it, using a rung as the load-bearing point.

(2) Equipment/Materials

- a. Extension ladder (double or triple) 1
- b. Rope (20-30 meter) 1

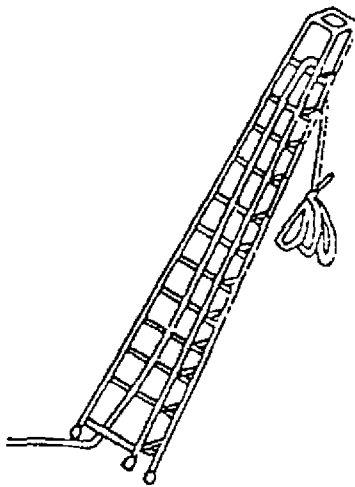


Fig. 7-1 How to extend rope

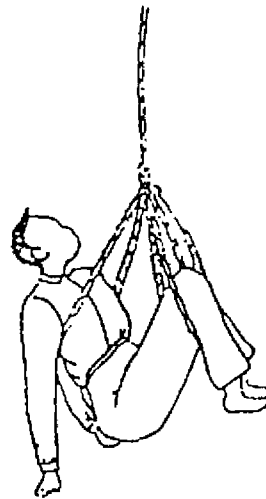


Fig. 7-2 Body sling made from a triple-loop bowline knot

(3) Setup

- a. Set the ladder so that the rescuer can reach the upper part of the window out of which the rescue will be done.
- b. Make a triple-loop bowline knot at one end of the rope to use as a sling for the victim. Run the knot under the bottom rung of the ladder and over all of the other rungs. Extend the rope and hang it over the second or third rung from the top to drop behind the ladder. (Fig. 7-1)

(4) Rescue

- a. Place the victim in the triple-loop bowline sling and lower the victim from the ladder rung in coordination with the belayer of the rescue rope. (Fig. 7-2)

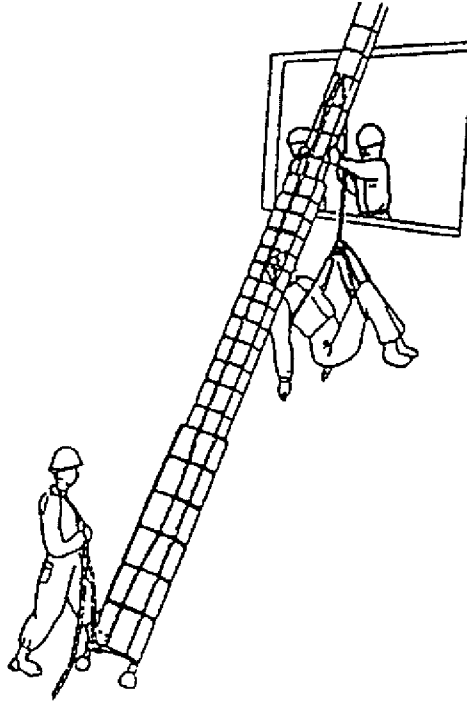


Fig. 7-3 Emergency ladder rescue

- b. The firefighter on the upper floor holds the side rails of the ladder, pushing the ladder outward and holding it away from the building.
- c. To belay the rescue rope, in a standing position place one foot on the rung under which the rope passes, and hold onto the rope.
- d. Slacken the rescue rope to gently lower the victim. (Fig. 7-3)

(5) Cautions

- a. Make sure the base of the ladder is established firmly.
- b. Make sure the ladder string is tied to its rung properly and its hooks set properly.
- c. Do not attempt to raise the ladder from the top. (Doing so will cause the latches to become unhinged.)

- d. When placing the weight of the victim on the rope, avoid putting a sudden load on the ladder rung.
- e. Prior to lowering the victim, check the victim's position, and make sure that the ladder is stable and the safety rope secure.
- f. Let out the rescue rope smoothly and carefully, so as not to alarm the victim.
- g. Do not allow the victim to touch the ground directly. Have another firefighter catch and gently carry them down.
- h. When training with this rescue method, it is imperative to consider the strength of the load-bearing ladder, and to reinforce the load-bearing rung with a small spar.

2. Horizontal Rescue Using a Ladder

(1) Objective

When a rescue from an upper floor or from atop a structure at a construction site is required where the victim must be kept in a supine position, this method is used. A ladder is leaned against the structure and a combination of stretcher, ropes, etc., is used to safely and surely rescue the victim.

(2) Equipment/Materials

- | | |
|--|---|
| a. Stretcher | 1 |
| b. Extension ladder (double or triple) | 1 |
| c. Rope (50 meter) | 1 |
| d. Rope (30 meter) | 1 |
| e. Pike pole | 1 |
| f. Carabiners | 6 |
| g. Sling ropes | 5 |
| h. Small spar | 1 |

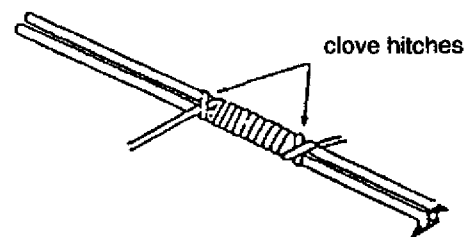


Fig. 7-4

(3) Setup

- a. Set the ladder so that the upper part of the window out of which the victim will be extracted can be reached.
- b. Lay the reinforcing spar against the second or third rung from the top to bear the weight.

- c. Fold the 50-meter rope back on itself, and pass the bight end under the bottom rung of the ladder, over the other rungs and hang it over the load-bearing rung to drop down behind the ladder.
- d. To be able to push and hold the ladder away from the building at the load-bearing point 2-3 rungs from the top, cross two pike poles and tie them to the side rails and rungs of the ladder with a clove hitch and single hitch. (Fig. 7-4, 7-5)

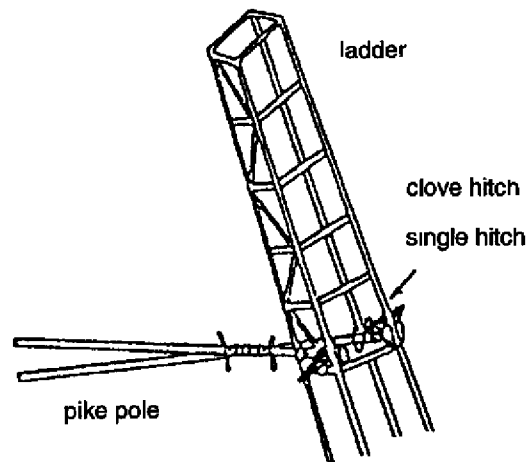


Fig. 7-5 Attaching the pike poles

- e. Attach two sling ropes to the stretcher, one at the head and one at the foot using a clove hitch and single hitch at each point. Tie a loop knot in the center of each sling rope, and hold the two loops together with carabiners. (Fig. 7-6)

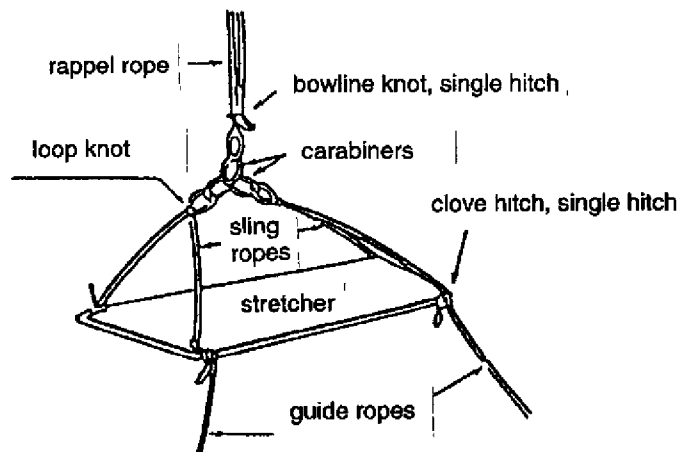


Fig. 7-6 Stretcher suspended from a single point a/ rappel rope

(4) Rescue

- a. Strap the victim to the stretcher.
- b. Attach the rescue rope to the stretcher using carabiners, and hang the stretcher from the ladder rung in coordination with the belayer who lets out the rope.
- c. The firefighter on the upper floor holds the pike poles and pushes the ladder away from the building.
- d. The belayer of the rescue rope at the base of the ladder stands with one foot braced against the bottom rung under which the rope passes. (Fig. 7-7)
- e. Slacken the rescue rope to gently lower the stretcher.

(5) Cautions

- a. When attaching the sling ropes to the stretcher, adjust the length of the ropes so that the head of the stretcher remains slightly higher than the foot.
- b. Consider sufficiently the elasticity of the rescue rope to ensure complete safety.
- c. Push the ladder away from the building carefully, making sure that the ladder remains stable.

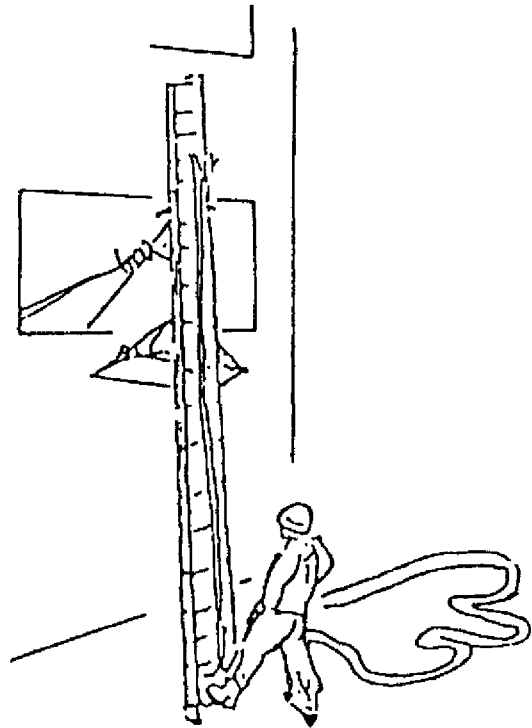


Fig. 7-7 Horizontal rescue using a ladder

- d. Try to lower the stretcher very gently when it reaches the ground in consideration of the victim's condition. If other people are around, have them catch the stretcher.
- e. At the top of the ladder, establish a position so that you can work freely with both hands.
- f. Let out the rescue rope smoothly and carefully.
- g. If there is an obstruction to the lowering of the stretcher against the wall, use the guide ropes to avoid it.

- h. When lowering (or lifting) the stretcher, make sure that the carabiners attached to the rescue rope (rescue rope) do not turn sideways.
- i. Always use leather gloves to hold the rescue rope.

3. Horizontal Stretcher Rescue from a Single Suspension Point

(1) Objective

When lowering a victim from a high place or lifting a victim from a low place, where the victim must be kept in a supine position due to their condition, use this method for a safe, sure rescue.

(2) Equipment/Materials

- a. Stretcher 1
- b. Ropes (50 meter)..... 2
- c. Ropes (30 meter)..... 2
- d. Sling ropes 2
- e. Carabiners 6
- f. Rope-protecting material some

(3) Setup

- a. Set up two load-bearing points for the rope.
- b. Set up the stretcher from a single suspension point as described above in Step (3)e. of the previous section (2. Horizontal Rescue Using a Ladder).
- c. Tie guide ropes onto both the head and foot of the stretcher.
- d. Use two 50-meter ropes together; pass them through the load-bearing points for security, and attach to the stretcher using carabiners.

(4) Rescue

- a. Strap the victim to the stretcher securely.
- b. Lower the stretcher gently in coordination with the belayer who lets out the rescue rope.

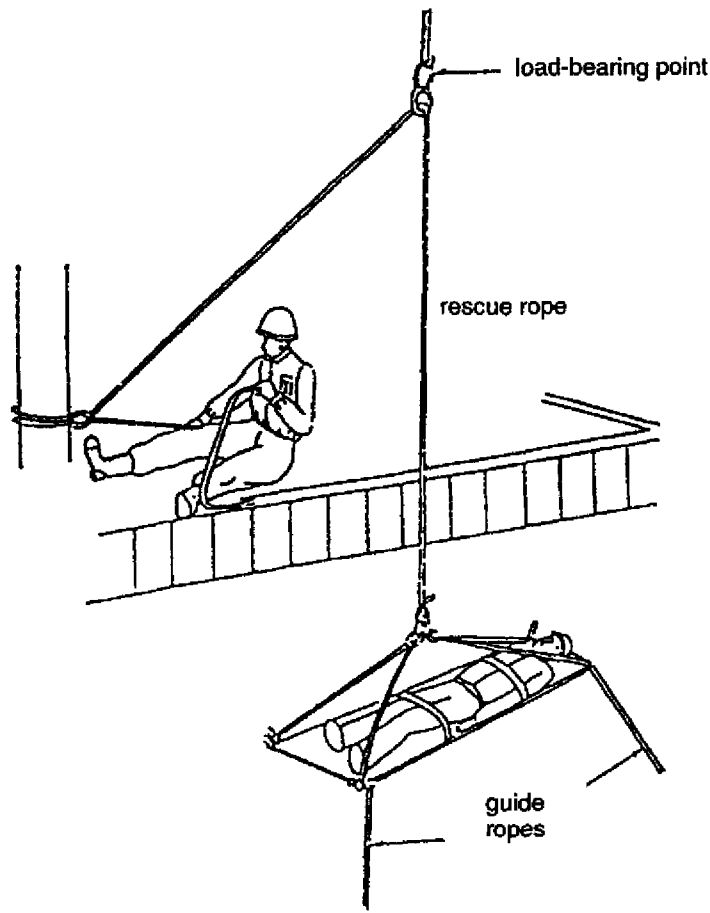


Fig. 7-8

- c. Slacken the rescue rope to gently lower the stretcher.
- d. Manipulate the guide ropes in coordination with the lowering of the stretcher to create enough of a gap so that the stretcher does not scrape against the wall. (Fig. 7-8)

(5) Cautions

- a. When attaching the sling ropes to the stretcher, adjust the length of the ropes so that the head of the stretcher remains slightly higher than the foot.
- b. Consider sufficiently the elasticity of the rescue rope to ensure complete safety.
- c. The belayer must secure his position depending on the conditions of the rescue location.
- d. Always use guide ropes when lowering the stretcher.
- e. Using a pulley block at the load-bearing point makes it easier to lift a person out of a low place.

- f. When lowering (or lifting) the stretcher, make sure that the carabiners attached to the rescue rope do not turn sideways.
- g. Let out the rescue rope smoothly and carefully.

4. Seated Rappel Back-Carry Rescue

(1) Objective

This is a rescue method used to rescue people who are wounded, who have been hanging off a building, or people trapped on high floors in a fire, as a way to carry them piggyback down to safety.

(2) Equipment/Materials

- a. Ropes..... 2
- b. Sling ropes 4
- c. Rope-protecting material..... some

(3) Setup

- a. Set up the rappel rope.
- b. Join the two sling ropes with a square knot plus single hitch, and use this as the rope to lash the victim to your back.
- c. From the center of sling rope, tie a prussik knot and attach it to the rappel rope. Tie the ends of rappel rope together according to the size of the victim, using a square knot plus single hitch, and use it to secure the upper body of the victim.
- d. Put a safety helmet on the victim to prevent risk from falling objects.

(4) Tying Victim onto Back

- a. Place the rope slightly above the center of the back of the victim with the victim high on the back of the rescuer; slide the ends of the sling ropes under the armpits of the victim and over the shoulders of the rescuer to the front. (Fig. 7-9)

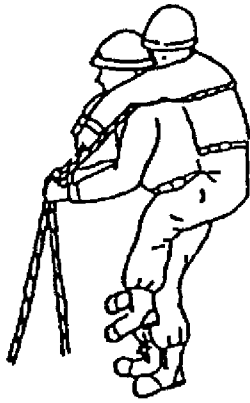


Fig. 7-9

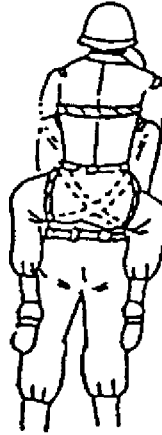


Fig. 7-10

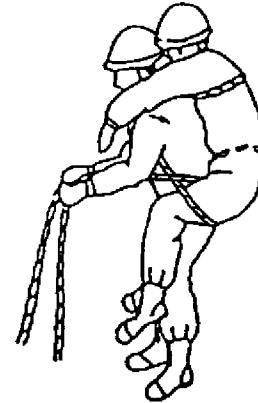


Fig. 7-11

- b. Twist the sling ropes two or three times at the chest of the rescuer and cross the ends; pass the ends over the outside and under the leg of the victim. (Fig. 7-10, 11)
- c. Bring these ends forward over the rope crossed at the rescuer's chest. (Fig. 7-12)
- d. Tie the ends together using a square knot at the belly, secured with a single hitch. The position of this knot should be on the side that the rescuer is not using for the braking hand, with the ends tucked under the rope.

(5) Wrapping the Support Rope

Wrap the rappel rope twice around the carabiner for a seated rappel. (Fig. 7-14)

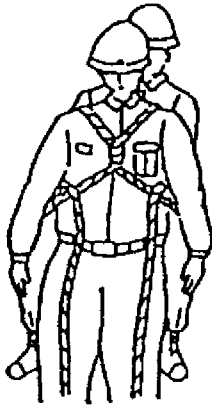


Fig. 7-12

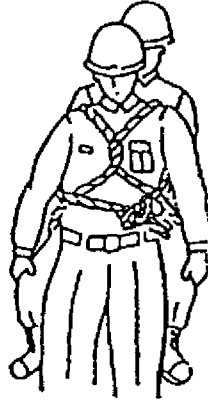


Fig. 7-13

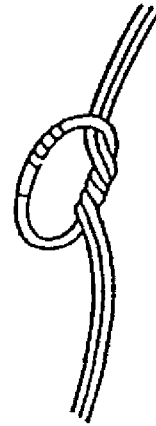


Fig. 7-14

(6) Rescue

- a. Drape the safety rope, which is attached to the rappel rope, over the upper body of the victim.
- b. Remove all the slack from the rappel rope side; extend the left arm and grasp the rappel rope immediately above the prussik belay that has been attached to the rappel rope; with the right hand pass the hanging part of the rappel rope inside the thigh of the victim against your (the rescuer's) hip; grasp the rope from behind the victim's leg to serve as a brake.
- c. Descend while sliding the prussik belay down so that it does not jam, rappelling down in a seated descent. (Fig. 7-15)

(7) Cautions

- a. The rescuer must always wrap the rappel rope twice around the seat carabiner.
- b. Keep the length of the back-carrying rope out of the way so that it does not get caught in the seat carabiner.
- c. When descending, always keep both hands on the rappel rope.
- d. Fully extend your legs and place the soles of your feet flat against the wall.
- e. When descending, move slowly to avoid causing the victim any strong shock.



Fig. 7-15

5. Emergency Ladder Truck Rescue

(1) Objective

When there is a person needing to be rescued at a high place that cannot be reached by the 3-extension ladder, this method is used to extend the truck ladder to the target floor. Suspending a rope from the ladder's rung, victims can thus be removed safely and quickly.

(2) Equipment/Materials

- a. Aerial ladder truck..... 1
- b. Rope (50 meter) 3
- c. Other supporting point materials..... some

(3) Setup

- a. Station the ladder truck in a position from which it is easy to extend the ladder to the target floor, and extend the ladder.
- b. Form a load-bearing point for safety for the rescue rope at an appropriate support point on the upper part of the lifter using a sling rope and carabiners.
- c. Form a triple-loop bowline knot at one end of the rescue rope to serve as a sling for the victim. As a reinforcing rope, pass the end of another rope through the three loops and form a simple bowline knot at the position of triple-loop bowline knot. Secure with an overhand knot and use the two ropes together as the rescue rope. (Fig. 7-16)

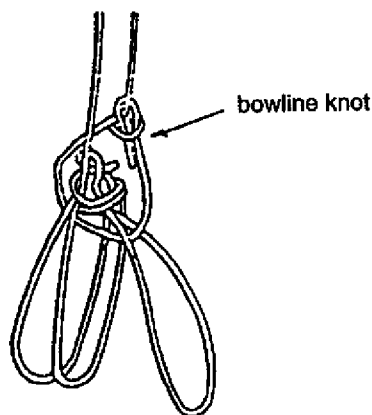


Fig. 7-16

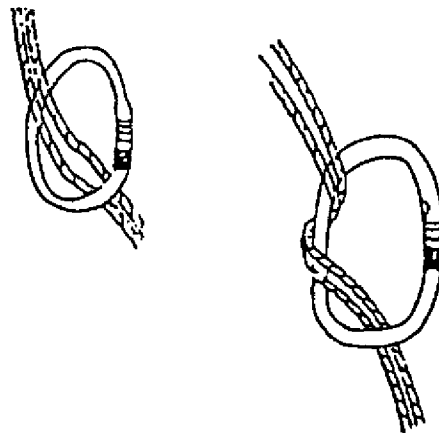


Fig. 7-17

- d. Lay this rescue rope on the second or third rung from the top of the ladder and have it hang down behind the ladder. Wrap the rope from above around the ring of the carabiner serving as the load-bearing point at the top of the lifter so that the rope comes to the left side. (Fig. 7-17)
- e. Attach a guide rope to the victim.

(4) Rescue

- a. Put the victim in the body sling formed by the triple-loop bowline knot and suspend the victim from the ladder rung in coordination with the rope belayer standing in the lifter.
- b. Stand the ladder up and push it away from the building. (Fig. 7-18)
- c. Secure the rescue rope with both hands on the rope while standing in the lifter. (Fig. 7-19)

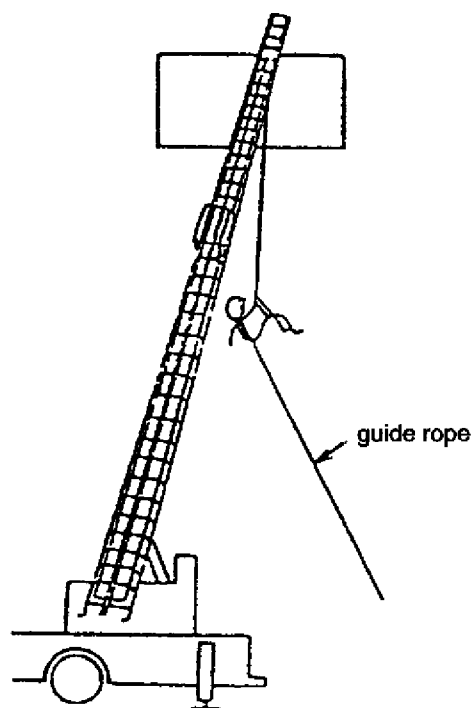


Fig. 7-18

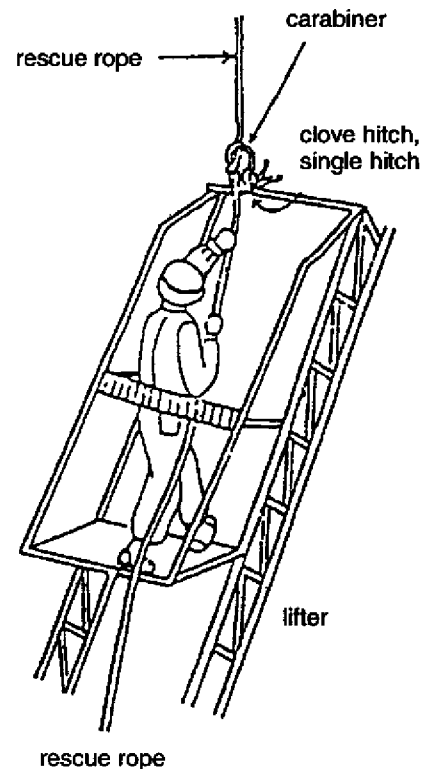


Fig. 7-19

- d. Slacken the rescue rope to gently lower the victim.

(5) Cautions

- a. When placing the weight of the victim on the rope, avoid putting a sudden load on the ladder rung.**
- b. Prior to lowering the victim, check the victim's position, and make sure the safety rope is secure.**
- c. Let out the rescue rope smoothly and carefully.**
- d. Do not allow the victim to touch the ground directly; have another firefighter catch them.**
- e. Always use a guide rope when lowering the victim.**
- f. When training with this rescue method, place a cloth or some other rope-protecting material on the load-bearing rung to protect the rope.**

Section 3 Rescue from Low Places

Emergency situations requiring rescue from a low place may include:

- ① Someone trapped in a fire on the ground floor
- ② A fall at an underground construction site
- ③ Gas poisoning or oxygen deficiency underground
- ④ A landslide
- ⑤ Water rescue situation
- ⑥ Other

All of these rescue situations involve difficulty in grabbing hold of the victim, with restricted range of movement and difficulty in communicating commands, instructions and information. Also present are the risk of secondary injury and obstructions to rescue efforts.

The method of entry to the scene of the emergency and the methods of rescue and removal will vary according to the actual circumstances, but it is always important to use the safest, surest means to perform the rescue. These can include using facilities available at the scene of the emergency (temporary stairs, ramps, wooden ladders, etc.), equipment available at the scene of the emergency (block and tackles, rope baskets, crane trucks, winches, etc.), or firefighting equipment and materials (carry-on ladders, blocks, rescue ropes, rescue straps, etc.). Here, methods of rescue for victims in low places will be covered that are to be used when other methods will not work due to the particular situation and limitations of the firefighting rescue squad's equipment.

1. Block-and-Tackle Lift Rescue

(1) Objective

A block-and-tackle lift rescue involves the use of rescue ropes, sling ropes, pulley blocks, a rescue strap and other devices to lift a victim upwards. It is especially useful when there are not many people to help out, as it makes lifting relatively easy.

(2) Equipment/Materials

| | |
|----------------------------------|------|
| a. Ropes (50 meter)..... | 2 |
| b. Sling ropes | 2 |
| c. Pulley blocks..... | 2 |
| d. Carabiners | 9 |
| e. Rescue strap | 1 |
| f. Rope-protecting material..... | some |

(3) Setup

- Fasten the end of the rope to a mooring point using a double knots.
- Clip onto this rope a pulley block and carabiners (including reinforcing carabiners) to serve as a running block, and attach the rescue strap to this. (Fig. 7-20)
- Extend the rope, lower the running block with the strap attached to it, and have a firefighter hold the end of the rope.
- Tie a sling rope to a mooring object above for the load-bearing point; attach a pulley block and carabiners (including those for reinforcement); and pass the rope that the firefighter is holding through the block and carabiners to serve as a standing block. (Fig. 7-21)
- Tie a prussik knot using a sling rope to the rope hanging down from the standing block.

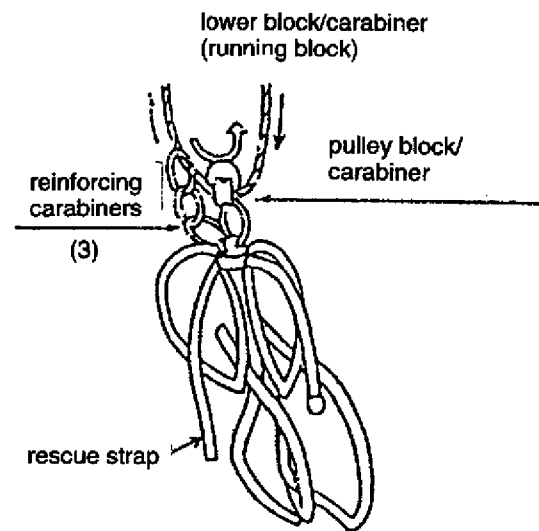


Fig. 7-20

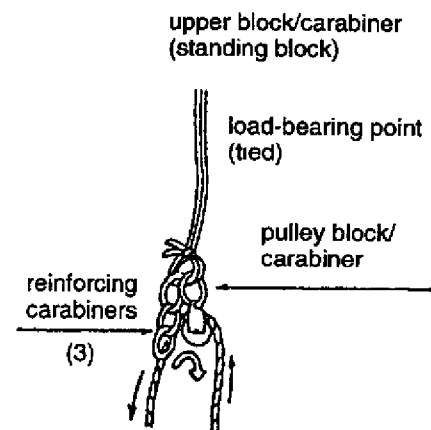


Fig. 7-21

- f. Fasten the extra length of the prussik knot to a fixed object. (Fig. 7-22)

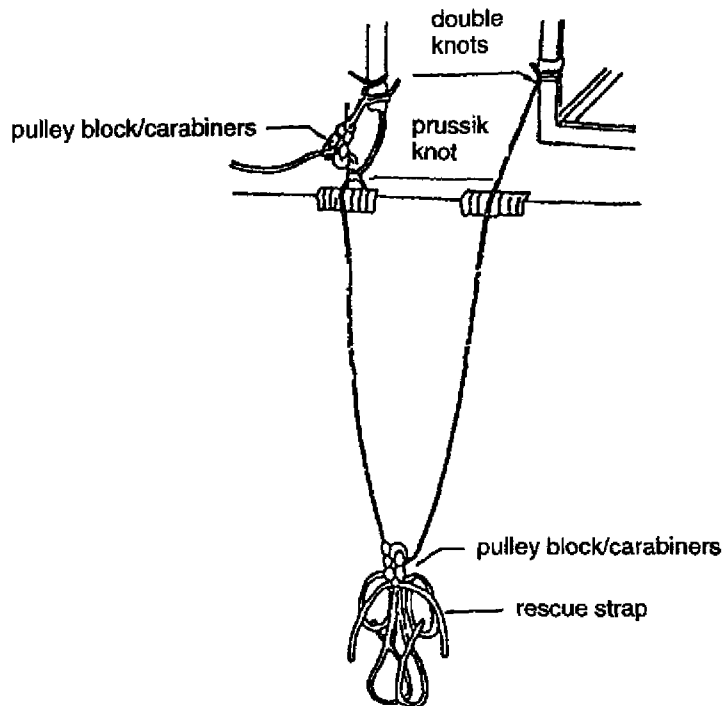


Fig. 7-22

(4) Entry

The firefighter enters using facilities available at the scene or using a rescue rope.

(5) Rescue

- a. The rescuer fastens the rescue strap to the victim, and clips the running block and reinforcing carabiners onto the rescue rope.
- b. One firefighter at the top pulls the rope gently, while another slides the prussik knot attached to the rescue rope. (Sliding the knot down to prevent it from braking the lift.)
- c. Repeat this process to lift the victim. (Fig. 7-23)
- d. To further ensure safety, tie a bowline with single hitch at the end of another rescue rope, clip a carabiner to the loop, and clip this carabiner onto the D-ring of the rescue strap to support and secure the lift. (Fig. 7-24)

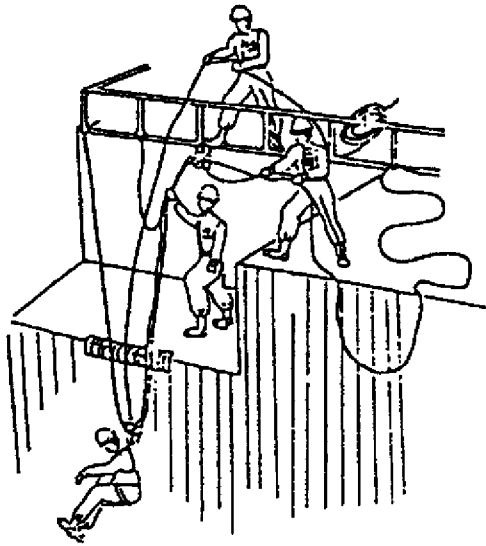


Fig. 7-23

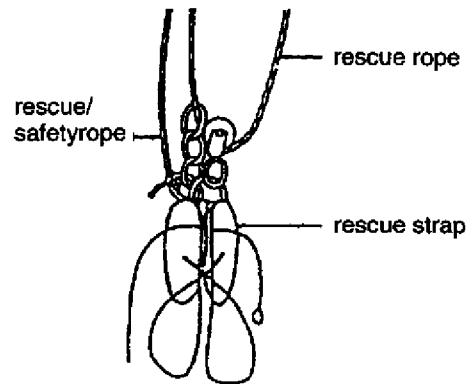


Fig. 7-24

(6) Cautions

- a. If the angle formed by the load-bearing point of the rope, the firefighter and the victim is too small, it will make lifting difficult.
- b. Lifting using this method can be done by a single person, but if there is one person to lift and one person to slide the prussik knot (which temporarily supports the full weight being lifted when it is slid down), it makes the lift go more smoothly.
- c. When setting up the upper and lower pulleys (running, standing) and carabiners (including reinforcing carabiners), arrange them in a position that prevents the reinforcing carabiners from jamming in the pulley block with the movement of the rescue rope (lifting).
- d. At spots where the rope comes in direct contact with a surface, lay down a cloth or other rope-protecting material to prevent fraying or breakage of the rope.

2. Ladder Crane Rescue

(1) Objective

When lifting a victim from a low place, use a carry-on ladder as a crane with blocks (both running and standing) to easily, safely and surely carry out the rescue.

(2) Equipment/Materials

| | |
|---|------|
| a. Double or triple extension ladder..... | 1 |
| b. Rope (50 meter) | 2 |
| Rope (30 meter) | 2 |
| c. Carabiners | 12 |
| d. Pulleys..... | 3 |
| e. Rescue strap | 1 |
| f. Sling ropes | 2 |
| g. Rope-protecting material | some |

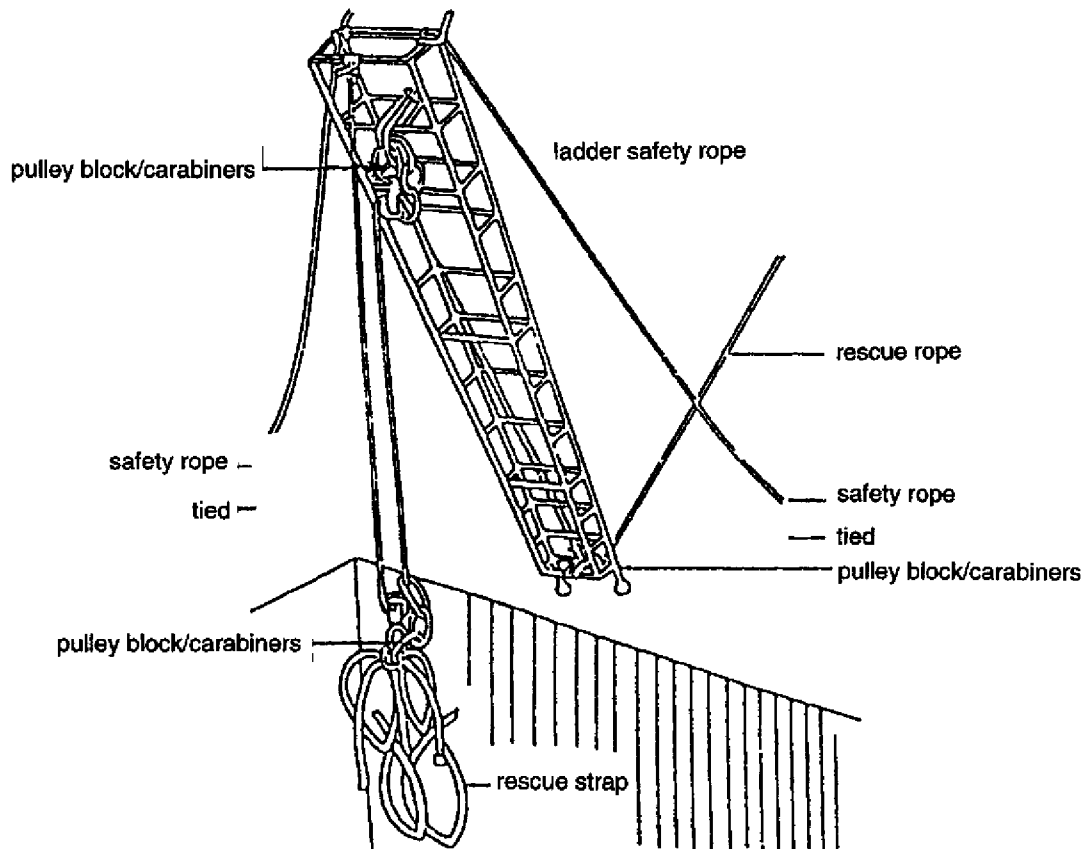


Fig. 7-25

(3) Setup

a. Attaching the standing block

- 1) With the double or triple extension ladder in a closed position and its front side facing up, fold a sling rope back on itself and tie to the second or third rung from the top, using a clove hitch with single hitch in the center of the rung.
- 2) Attach a pulley block to the sling rope from behind the ladder, and strengthen with carabiners (3 linked together). (Fig. 7-25, 26)
- 3) Next, at the bottom of the ladder use the same procedure—double up a sling rope, tie it to the center of the bottom rung with a clove hitch and single hitch, attach a pulley block to the front of the ladder, and strengthen with carabiners (3 linked together). (Fig. 7-27)

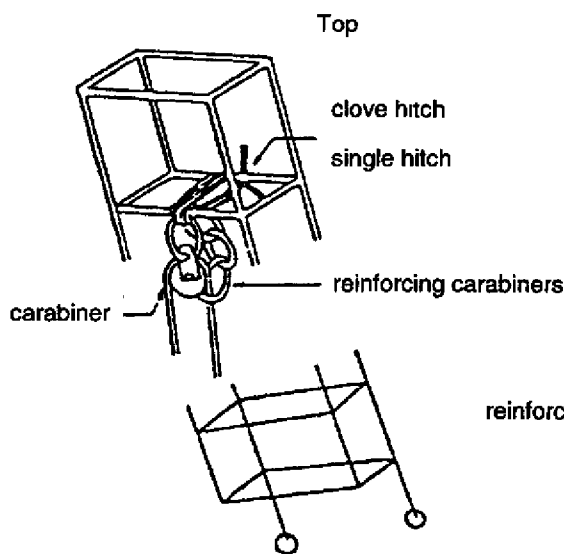


Fig. 7-26

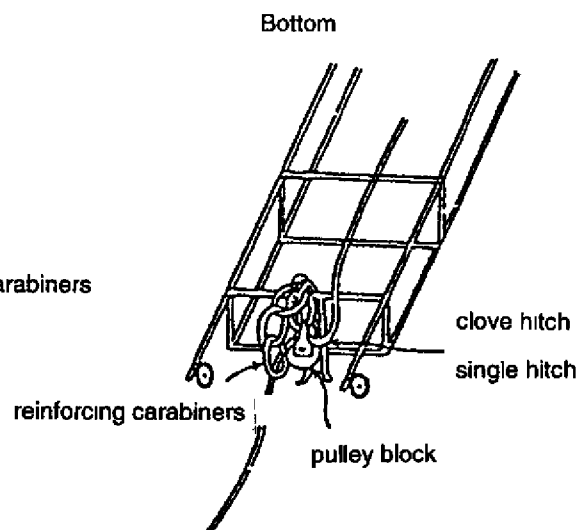


Fig. 7-27

b. Attaching the ladder safety rope

Tie a safety rope at the top of the ladder on each side at the corner of the top rung and side rail using a clove hitch and single hitch.

c. Setting up the rescue rope

- 1) Untie the rescue rope, pass one end through the carabiners and standing block at the bottom of the

ladder (first through the reinforcing carabiners, then through the pulley block); stand the ladder against the building at an angle of about 70 degrees; and pass the rope through from front to back keeping friction against the rung to a minimum.

- 2) Pass this rescue rope through the carabiners and standing block at the top of the ladder (first through the reinforcing carabiners, then through the pulley block), and tie to the top rung of the ladder in the center (put through the block fixture) using a clove hitch and single hitch. (Fig. 7-28)

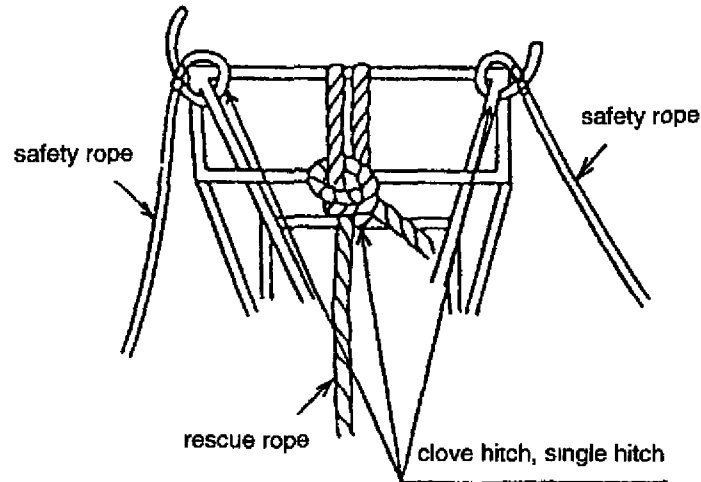


Fig. 7-28

d. Mounting the running block

Mount the running block between the top standing block and the end of the rescue rope fastened at the top; then clip on reinforcing carabiners (3 linked together) on the standing block side. (Fig. 7-29)

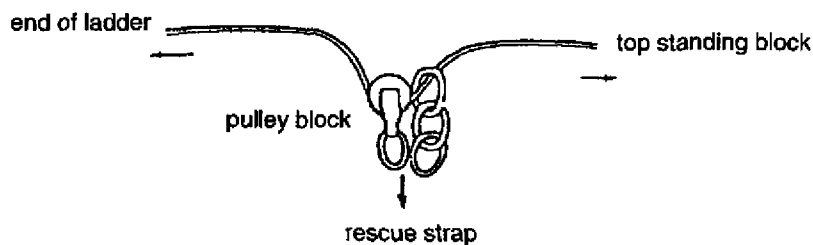


Fig. 7-29

(4) Entry

The firefighter uses either facilities available at the scene or a rescue rope to enter.

(5) Rescue

- a. Move the top part of the ladder to the target point (line); manipulate the safety rope (securing the body or tied on);

and stand the ladder at an angle of about 70 degrees.

- b. Fasten the rescue strap onto the victim; attach the running block to the rescue rope; and clip on reinforcing carabiners (3 linked together) on the top standing block side.
- c. Position firefighters at both sides of the base of the ladder and at the spot where the rescue rope is manipulated; ensure that the anti-slip stopper at the bottom is firmly in place; and continue checking the ladder while drawing the rescue rope.
- d. To further ensure safety, tie a bowline with single hitch at the end of another rescue rope, clip a carabiner to the loop and clip this carabiner onto the D-ring of the rescue strap. Pass this over the second rung from the top of the ladder from front to back, and secure according to the conditions of lifting of the victim.

(6) Cautions

- a. Be careful with the positioning of the reinforcing carabiners (3 linked together) of the blocks (both running and standing), making sure that they do not jam in the blocks with the movement of the rescue rope (lifting).
- b. Make sure the standing block is attached in the center between the side rails.
- c. Make sure that the base of the ladder does not slip; this will make it easier to manipulate the rescue rope (lift).
- d. Make sure that the ladder safety ropes on both sides remain symmetrically aligned.
- e. When securing the victim's body without using a ladder safety rope load-bearing point, secure the victim in a standing position (by the waist).
- f. Manipulate the rescue rope gradually while checking the position of the ladder.
- g. Depending on the condition of the victim, a stretcher can also be used for the rescue. When lifting the running block, if the distance to be lifted is large, the victim might start spinning due to the lay of the rope, and the rope can thus become twisted. To prevent the victim from spinning, keep hold on a safety rope from the bottom.

3. Rescue from Underground Vessel or Tank

(1) Objective

It is not uncommon when painting, repairing or doing other work on a water supply tank, reservoir tank, purification tank, underground tank, etc.,

for an incident to occur where gas leakage causes gas poisoning or oxygen deficiency. These types of tanks typically have very small openings from which to enter or exist (45 cm to 60 cm). For this reason, it is impossible to enter the tank wearing the respirator that is essential to the rescue effort. This is an entry and rescue method used in such conditions.

(2) Equipment/Materials

- | | |
|---|------|
| a. Rescue rope (30 meter) | 4 |
| b. Breathing apparatus (respirator) | 1 |
| c. Spare tank..... | 1 |
| d. Carabiner..... | 1 |
| e. Rope-protecting material..... | some |

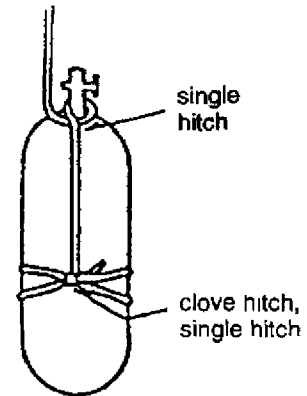


Fig. 7-30

(3) Setup

- a. Carry the spare tank to the tank opening; tie the spare tank onto the end of the rope using the air tank tying technique (protect as necessary with a blanket, etc.). Open the cylinder valve, lower into the vessel, and supply the victim with fresh air. (Fig. 7-30)
- b. Tie the breathing apparatus that the entering rescuer will wear with the end of one rope using the air tank tying technique. (Fig. 7-31)

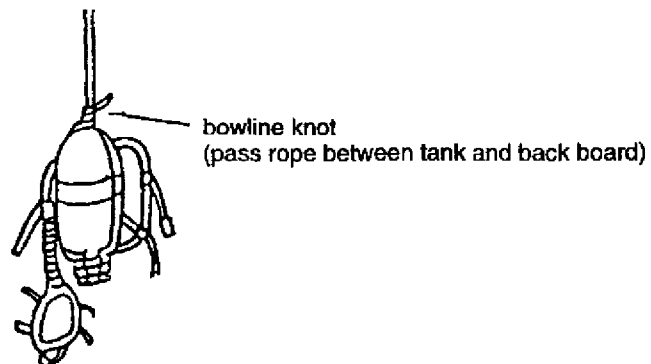


Fig. 7-31

(4) Entry

- a. The entry person forms a lifeline with a double-loop bowline body sling, ties a loop knot at the top end of this lifeline, clips a carabiner to the loop, puts on only the face mask of the breathing apparatus, and passes through the opening. (Fig. 7-32)

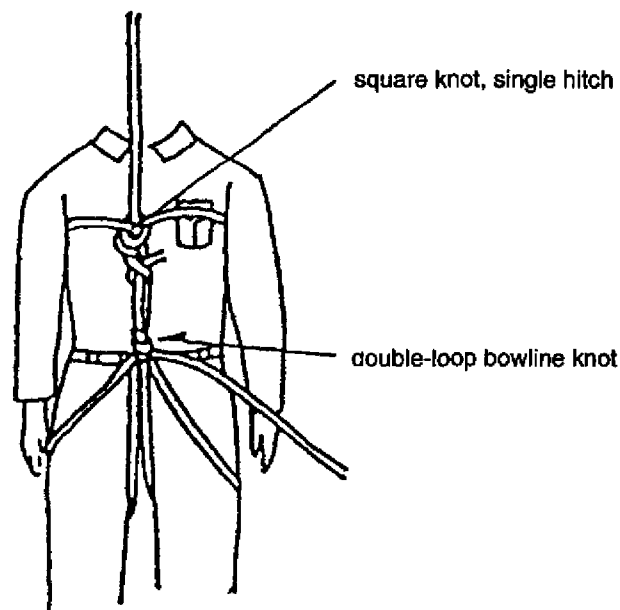


Fig. 7-32

- b. After passing through the opening, the rescuer clips the lifeline carabiner to the load-bearing point to secure his body, puts on the breathing apparatus that has been lowered down, unclips the carabiner and enters. (Fig. 7-33)
- c. When exiting, the entry procedure is done in reverse. The rescuer leaves the breathing apparatus directly below the opening, and takes off the mask after emerging from the tank.

(5) Rescue

- a. The rescuer that has entered ties a double-loop bowline body sling at one end of the rescue rope that has been lowered in, and attaches it to the victim.
- b. For the rescue, have the firefighters outside the tank lift the victim out, using the carrying rescue technique. (Fig. 7-34)

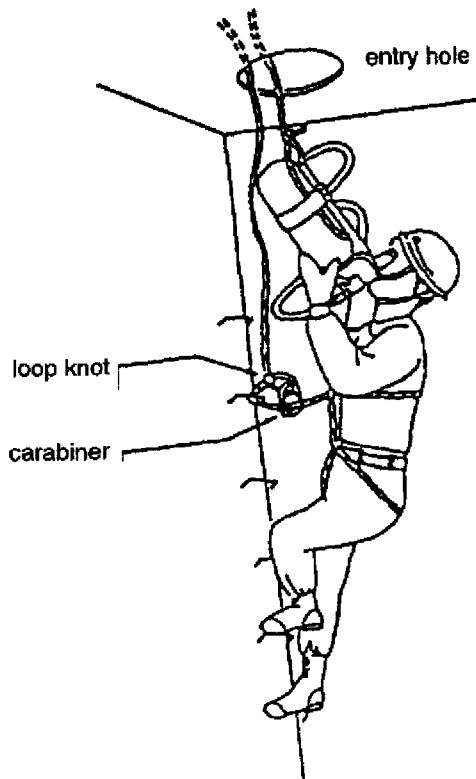


Fig. 7-33

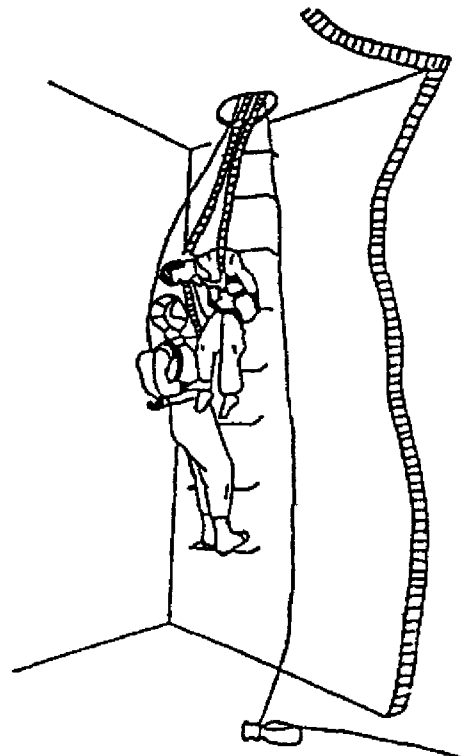


Fig. 7-34

(6) Cautions

- a. Tuck away all excess lengths of rope so that there is no confusion.
- b. Determine rope signals in advance.
- c. At spots where the rope comes in direct contact with a surface, lay down a cloth or other rope-protecting material to prevent fraying or breakage of the rope.
- d. Work with a ladder crane to make it easy to lift out the victim.
- e. Use different colored ropes, for example, to distinguish clearly between ropes used for different purposes.
- f. To blow in fresh air to victims inside the tank, use an air blower.

Section 4 Level-ground Rescue

Level areas are the ordinary places where we go about our daily business, so all kinds of large and small accidents and incidents may occur. Because the location is level, it is generally easy to approach the scene of the emergency, and in most cases it is relatively easy to enter. At times of emergency, however, there is always the possibility that some obstruction will appear and there is the risk of secondary injury unforeseen at the start. For this reason, the emergency situation must be fully assessed, and fail-safe measures taken.

1. Rescue on Hands and Knees

(1) Objective

This is the method to use to enter alone and rescue (bring out) a victim who has collapsed in a narrow passage such as a sewage pipe.

(2) Equipment/Materials

- a. Breathing apparatus 1
- b. Rope (30-50 meter) 1
- c. Sling rope 1
- d. Carabiner 1
- e. Light towel or triangular bandage 1

(3) Setup

- a. The entry person wears a breathing apparatus and carries a light towel or triangular bandage, tying a sling rope to both ankles using a clove hitch and single hitch.
- b. The support person forms a bowline at one end of the base rope, clips a carabiner to it, and attaches this carabiner to the entry person's sling rope as a safety rope. (Fig. 7-35)

(4) Entry

- a. The entry person gets down on hands and knees (all fours) and crawls forward quietly.
- b. The support person lets out the safety rope in coordination with the movement of the entry person.

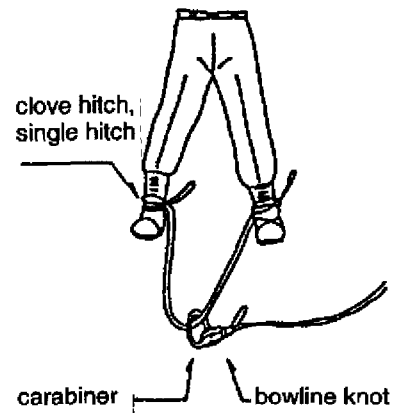


Fig. 7-35

(5) Rescue

- a. Tie the wrists of the victim together with the light towel or triangular bandage; drape the victim's wrists over the back of your neck, and crawl out backwards to safety, carrying the victim. (Fig. 7-36)
- b. The support person lets out the safety rope in coordination with the movement of the entry person.

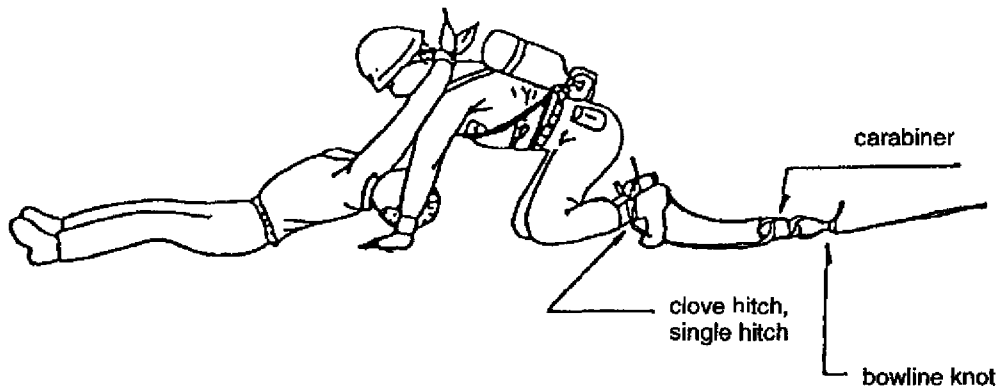


Fig. 7-36

(6) Cautions

- a. When carrying the victim out, make sure that their head does not scrape against the ground surface.
- b. When letting out the safety rope, be careful not to hinder the movement of the entry person.

2. Drag-out Rescue

(1) Objective

At the scene of a fire or other emergency situation where there is approaching danger and it is a race against time, this method is used to rescue the victim.

(2) Equipment/Materials

None in particular.

(3) Rescue

Reach the victim; loosen their collar; grasp the back of their collar with the palm facing down, and drag the victim out of range of danger. (Fig. 7-37)

(4) Cautions

- a. When performing this method of rescue, quickly assess and determine the level of urgency, how much time there is to get in and get out, and other safety issues.
- b. Make sure to protect the victim's body.

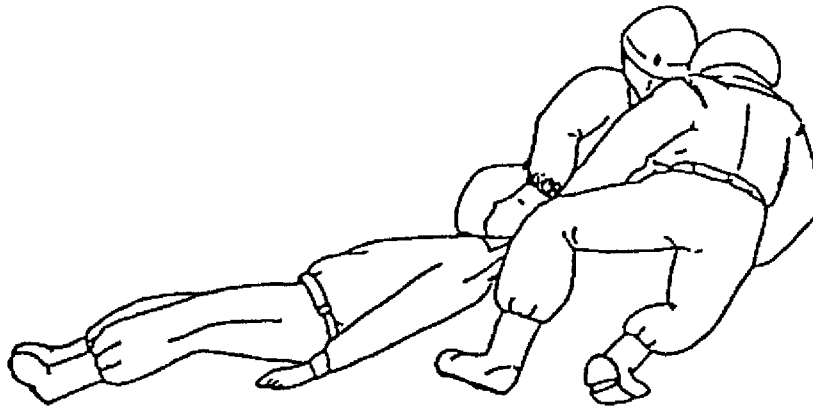


Fig. 7-37