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AERIAL RESCUE¹

by Richard G. Alvarez

Why aerial rescue? In 1973, Larry, a 17-year-old working for a contractor, was assigned the job of topping several eucalyptus in the back yard of a customer. The owner of the company accepted all kinds of jobs from landscaping and demolition to tree surgery. Larry, not having prior experience, was convinced how simple it would be to use a lineman's belt and spurs to climb the 60- to 70-foot eucalyptus trees which were 20+ inches in diameter. His gear was recently purchased at a surplus store.

The trees were located in the rear of a property with no access. There was a steep hill on the side where the trees would be felled. On the very first tree, Larry, with instructions from his boss, undercut the top approximately 30 feet above the ground to fell the top up hill. This was done properly, but no one took into consideration that the top falling up hill would kick back, hitting Larry across the legs and also hitting the chainsaw and forcing it into his legs. To make matters worse, Larry had the saw running and when the limb hit, he accidentally triggered power to the saw, almost severing his left leg.

The boss, having some tree trimming experience, immediately called the property owner to get help, which he did. He also called the police and the fire department.

The owner of the company did not have available any extra gear, such as ladders, rope and spurs. Since the injured man in the tree did not have any tail to his rope, the owner could not climb the slick-barked eucalyptus to rescue his man. The police arrived and they were in the same position. The fire truck arrived with an aerial lift and could not immediately get into the backyard. It took almost two hours to rescue Larry from the

tree. He lost the leg above the knee, but he could have bled to death.

Why aerial rescue? It makes good sense to have all employees trained in aerial rescue.

Aerial rescue has an ANSI — Z133.1-1979 Standard: 3.7 *Rescue* which states: *Rescue procedures for employees working above ground shall be established by an employer, and the employees trained accordingly.*

In California, it is a Cal-OSHA Standard. Date of Adoption: March 27, 1980. *Article 12: Tree Work, Maintenance or Removal. 3421: General*

(d) The employer shall train and instruct his employees in the hazards involved in their job assignments, including the proper use of all equipment utilized in tree work, maintenance or removal operations. Such training shall be documented by the employer to certify that the employee has satisfactorily completed the training program prior to performing the job assignment.

(n) Rescue procedures for employees working above ground shall be established by the employer, and the employees shall be trained in first aid, cardiopulmonary resuscitation (CPR), and aerial rescue. Standards for CPR training shall follow the principles of the American Heart Association or the American Red Cross.

Our company has been training our personnel in aerial rescue procedures since 1973 in order to qualify our workers to be qualified line-clearance tree trimmers and be recognized by Cal-OSHA, to work within the 10 feet of energized lines over 750 KV.

We published a bulletin which is part of the Training and Safety Program that I wrote for the Western Chapter of the I.S.A. This bulletin is enclosed as part of my program. In order to

¹Presented at the annual conference of the International Society of Arboriculture in Hartford, Connecticut in August 1980.

develop this program, we chose several crews working in several different circumstances like 3-man crew, 2-man crew, aerial lift crew, etc., and asked each crew to perform an aerial rescue under given conditions such as:

1. Contact with energized lines and worker unconscious, approximately 40 feet in the air.
2. Worker injured in aerial lift and truck in-operative.
3. Worker injured in the tree with *no* lateral branch in which to lower him and the rescuer must tie a false crotch.

We were surprised at the minimum amount of tools and equipment needed for a rescue. All of the tools required are carried on our rigs in the general course of our everyday work. No specialized equipment is needed.

We now use several means to get our aerial rescue techniques accepted. I feel that these are all good, but nothing takes the place of auditing a crew and having them perform a rescue for the supervisors on the spot and documenting all participants. Other methods are:

1. Slide presentations.
2. Giving the crew the *Aerial Rescue* bulletin, have them read it and then give them a written test.
3. Video tape aerial rescue cassette produced by our company, showing several ways of rescue. I might mention that it is very important to give written tests and attach this test to the employee's file just to protect your company in case of the need of an aerial rescue and your company is questioned by OSHA.

Following is a pictorial essay on aerial rescue situations and solutions.

In case of an emergency which may result in a serious personal injury, a supervisor, foreman or employee in charge may modify or suspend any of these rules as he may consider temporarily necessary to permit proper handling of the specific emergency. In any such case, the person so acting shall be fully accountable for the reasonableness of his actions and for any accident or service interruption resulting therefrom.

In addition to any current safety, accident prevention, educational or training program, each supervisor or foreman shall make certain that all employees under his jurisdiction are instructed and advised concerning the applicable rules and their application.

Each employee of the Company shall be required to know and understand the rules which apply to the work he is performing. Employees shall be subject at any time to an examination on the rules herein contained which apply to their duties.

These rules shall be strictly interpreted to bring about maximum compliance and safe conduct and shall take precedence over any conflicting instructions. However, lawful and applicable governmental regulations which may be contrary to these rules shall control.

In preparing these "Emergency Practices" for those situations where an electrical contact may occur, it is intended that every effort will be made to adhere to Company safe work practices at all times. If safe work practices are followed none of the recommended "Emergency Practices" should ever be used. "An ounce of prevention will always be worth more than pounds of cure."

It is intended that thought will be given by those performing any work of what could result if a mistake is made or the job is poorly planned. In order to react well in an emergency a person will in most instances react automatically if he has been prepared beforehand and has a full understanding of what he should do.

There are and will be thousands of different approaches in planning for emergency situations but a poor plan is better than none at all. When an electrical contact occurs, it should be remembered that time becomes the enemy. The longer the human body is directly or indirectly in contact with an electrical conductor and electricity can flow through any part of the body to another conductor or ground every effort should be made to break the path as quickly as possible.

When trying to rescue a man in trouble and in contact with an electrical conductor, too often the person trying to rescue the victim becomes a victim himself. As a rule there is nothing to indicate that a man has contacted an energized conductor

until suddenly he has become immobile or has slumped in his work position.

The following precautions and actions should always be taken when working near energized electrical conductors:

1. Always have a clean dry rope, throw line and pole pruner out of the truck and accessible any time a man is aloft working in a tree or aerial lift near energized conductors. This will save some time if any emergency arises.

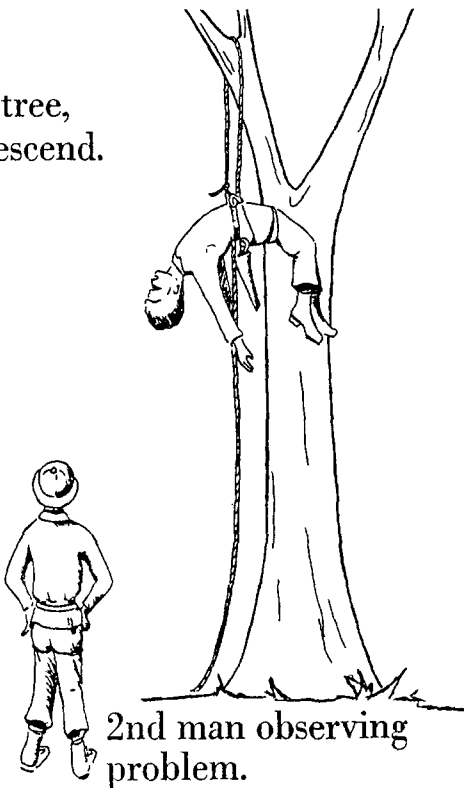
2. If an Electrical Contact is suspected, always proceed with caution so as not to contact an object that may be energized as a result of the contact.

Situation 1.

An injured man is in a tree unable to descend under his own power. The fastest, safest way to bring this man down is to climb using spurs and lower him on his own rope. This is best even when an aerial lift is on the job.

Situation 1.

A
Man in tree, can't descend.



Get emergency gear from truck.

Pocket knife or cutting tool.

Extra 150' climbing rope with snap.

12' tag line.

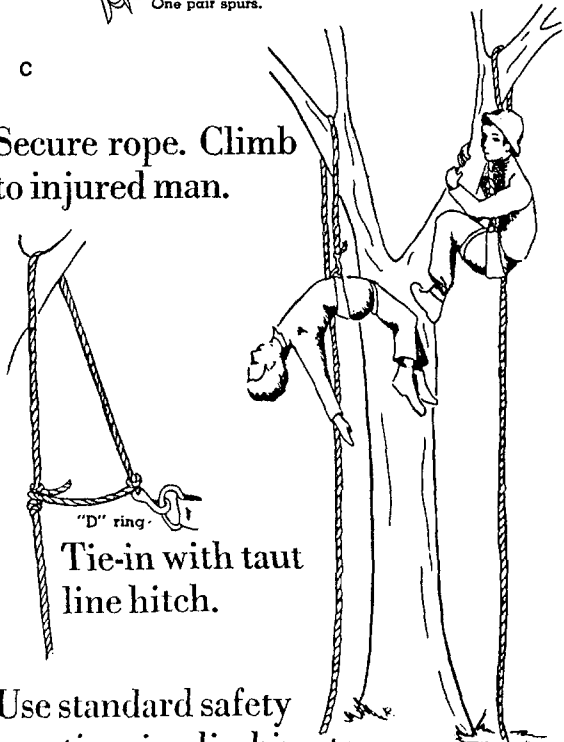
Extra throw line and weight.

Carry on every crew.

One pair spurs.

One pole pruner.

C
Secure rope. Climb to injured man.



Use standard safety practices in climbing to reach man the safest, fastest way!

D No. 1 Check breathing.

Apply mouth-to-mouth resuscitation if necessary.

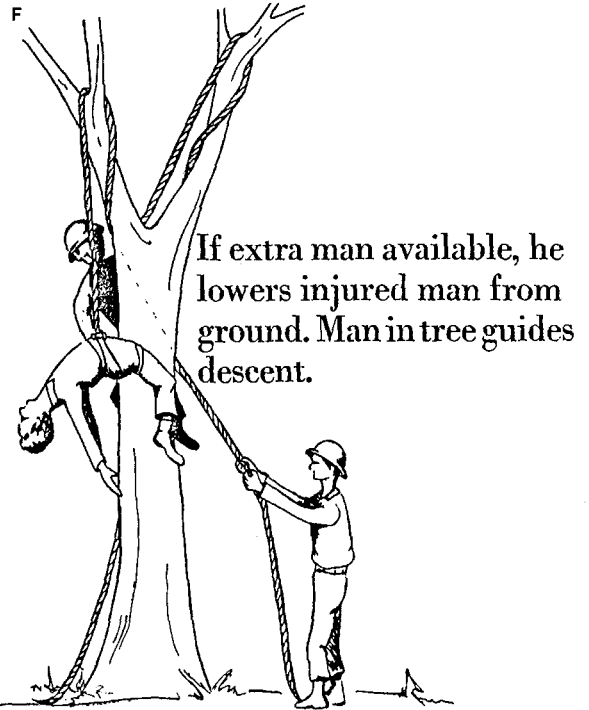
No. 2 Check bleeding.

Apply pressure to injury if bleeding severe.



No. 3 Check broken bones.

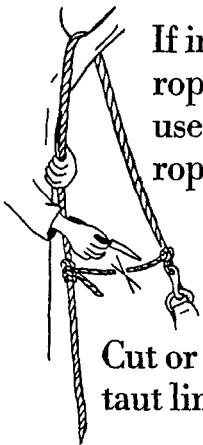
Do Not Lower if neck or back appear broken. Tie-in securely to tree and get help!



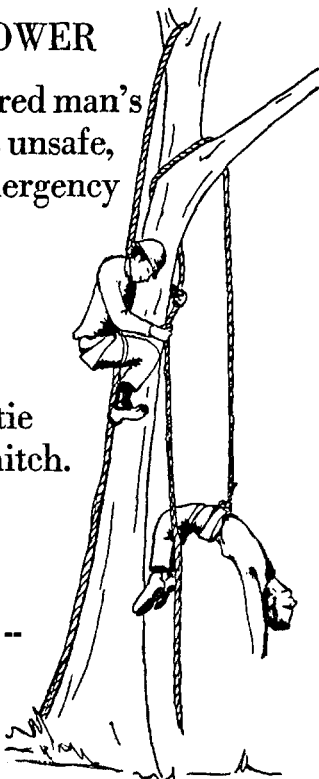
If extra man available, he lowers injured man from ground. Man in tree guides descent.

E TO LOWER

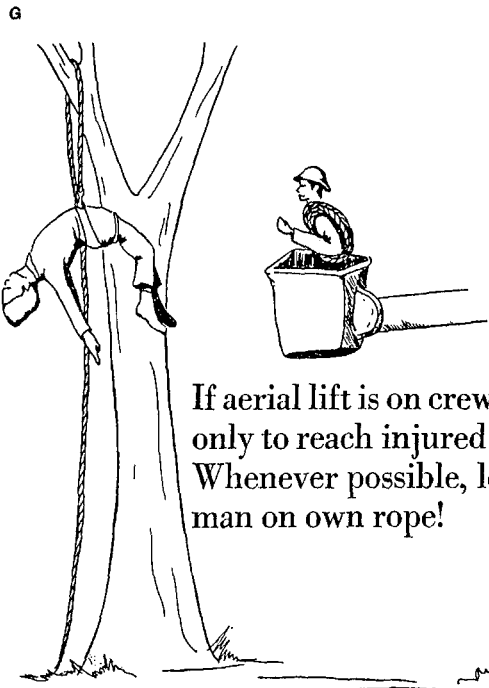
If injured man's rope is unsafe, use emergency rope.



Cut or untie taut line hitch.



Lower like log -- gently.



If aerial lift is on crew, use only to reach injured man. Whenever possible, lower man on own rope!

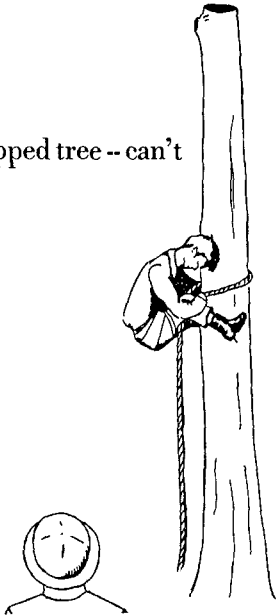
Situation 2.

Similar situation, however, there are no crotches left in the tree to tie in on, and a false crotch must be made in order to lower the man successfully.

Situation 2.

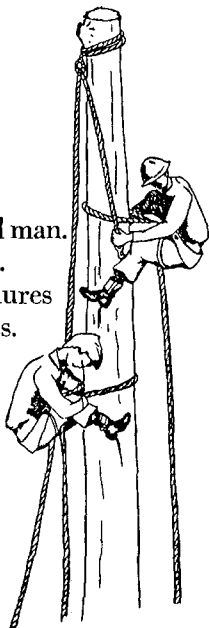
A

Man in topped tree -- can't descend.



B

Climb above injured man. Tie-in false crotch... Use lowering procedures in previous examples.



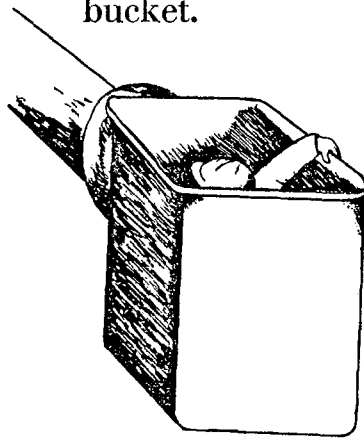
Situation 3.

An injured man is in an aerial lift bucket and the truck controls are inoperative. Several solutions are shown.

Situation 3.

A

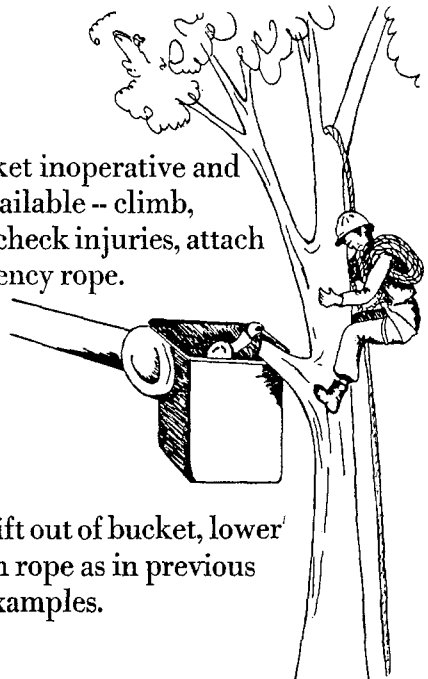
Injured man in aerial lift bucket.



-- Controls inoperative --

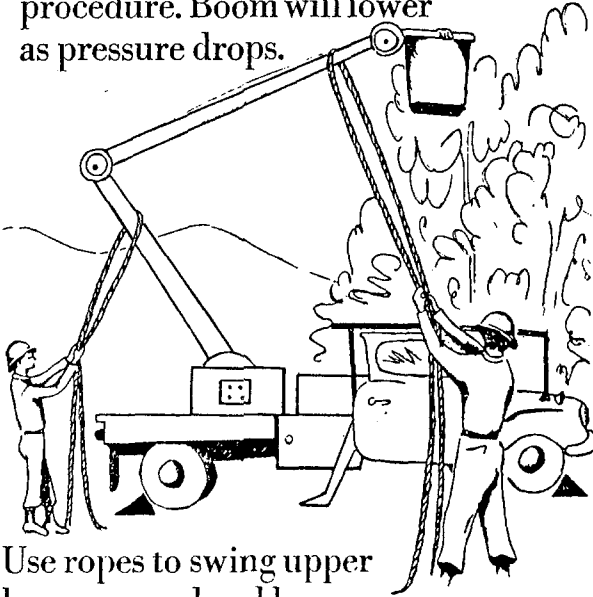
B

If bucket inoperative and tree available -- climb, tie-in, check injuries, attach emergency rope.



Lift out of bucket, lower on rope as in previous examples.

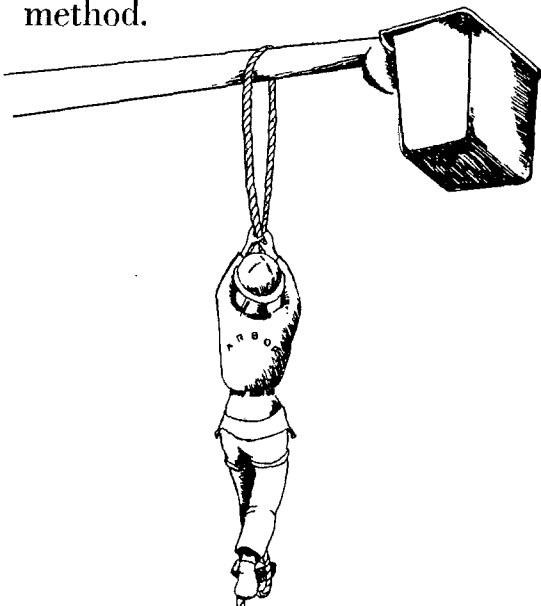
^c No tree -- use manufacturers emergency lowering procedure. Boom will lower as pressure drops.



Use ropes to swing upper boom around and lower boom back down.

^d

If manufacturers lowering procedures do not work - climb, use foot lock method.



Situation 4.

A man in the tree has come in contact with an energized conductor through a tree limb he is removing.

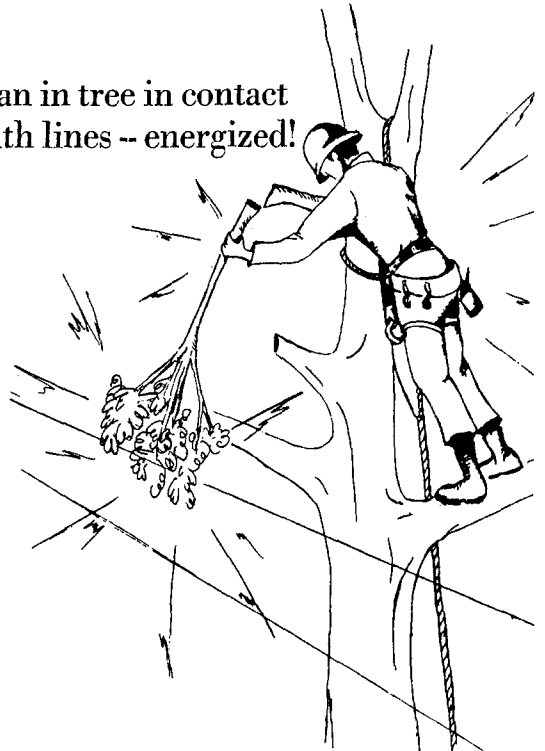
- Quickly survey the situation to see if it appears that a coil of rope can be thrown high enough to knock the limb free of the conductor.
- If (a) is not practical, a hand line may be thrown over the limb and then pulled to clear the limb from the conductor.
- If (b) is not practical then a throw line should be thrown over the conductor and the conductor pulled clear of the limb and tied off while the man is lowered to the ground.

Note: Should a throw line have insufficient strength to accomplish this, then a larger rope may be required or an alternate approach taken.

- Once the victim has been cleared from the energized conductor, his rope should be used by the rescuer to ascend and lower the victim to the ground as quickly as possible.

Situation 4.

Man in tree in contact with lines -- energized!



Situation 5.

If insulated aerial lifts are being used as they should be, this situation should cause no harm to anyone unless the pressure of the boom forces 2 conductors together. Should this occur, the conductors may burn down or protective equipment may de-energize the electrical circuit but the operator should be in no apparent danger.

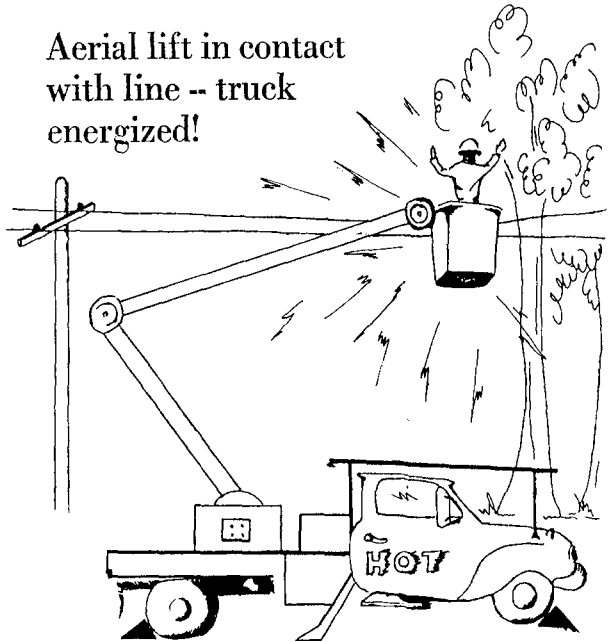
Should an uninsulated aerial lift come in contact with an energized conductor, the operator should be in no danger. **HE WOULD BE IN DANGER** should he touch a conductor that is not in contact with the aerial lift. The danger would be to anyone on the ground that may come in contact with any part of the energized vehicle.

If this should occur, it may be possible for a man on the ground to leap onto the truck to operate controls if the bucket operator has become unconscious. This should never be attempted unless the person is relatively sure he may do so without making a circuit to ground. Once on the truck it should be safe to operate any controls. Should it be necessary to leave a vehicle that has become energized the same approach should be taken and he should leap clear of the vehicle.

A person receiving electrical shock is subject to heart fibrillation or stoppage plus respiratory failure. Immediately check for a pulse and for breathing.

Situation 5.

Aerial lift in contact with line -- truck energized!



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