



Azzard

Made in USA
of US and foreign components

Lanyard for Tower Climbers

PRODUCT LABEL



RTR Ltd. Photo

INTRODUCTION

Lead climbing, a rock climber's skill, can be used to safely access towers and other tower like structures that do not have a safety system already installed. Lead climbing is an advanced skill that requires specific training and the use of good judgment to maintain an acceptable level of safety.

Lead climbing requires the placement of anchor points while ascending, and the CMC Azzard was designed for quick, one-handed placement of these anchor points. Originally designed to protect power transmission linemen on towers up to the normal range of 40 m (130 feet) in height, Azzards may be used on similar structures that allow them to be wrapped around a strong structural feature. By adding fall protection to otherwise unprotected structures, safer access may be attempted during inclement conditions such as wind and rain or when the tower is wet or covered with ice.

PRODUCT WARNINGS

The CMC Azzard was developed and is used in seminars given by Ropes That Rescue Ltd. for the power delivery industry, which addresses strict protocols and teaching standards. It is strongly recommended that the user of the Azzard be trained in use of this equipment by a qualified school such as the CMC Rescue or Ropes That Rescue Ltd. programs. Accessing towers and structures that do not have an installed fall protection system presents inherent risks that can only be reduced and controlled by proper instruction, supervision and judgment.

Work around energized equipment is beyond the scope of the general instructions for lead climbing using Azzards. Only personnel qualified to work on structures with energized equipment should perform the lead climb.

USER INFORMATION

CMC Rescue recommends separating the User Information from the equipment and retaining the information in a permanent record. CMC also recommends making a copy of the information to keep with the equipment and that the information should be referred to before and after each use.

INSPECTION

Inspect the equipment according to your department's policy for inspecting life safety equipment. The equipment should be inspected after each use by an inspector that meets your department's training standard for inspection of life-safety equipment. Record the date of the inspection and the results in the equipment log or on a tag that attaches to the equipment. Each user should be trained in equipment inspection and should do a cursory inspection before each use.

WARNING

- **SERIOUS INJURY OR DEATH MAY RESULT FROM THE IMPROPER USE OF THIS EQUIPMENT.**
 - **THIS EQUIPMENT HAS BEEN DESIGNED AND MANUFACTURED FOR USE BY EXPERIENCED PROFESSIONALS ONLY.**
 - **DO NOT ATTEMPT TO USE THIS EQUIPMENT WITHOUT PRIOR TRAINING.**
 - **USE, INSPECT, REPAIR ONLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.**
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The service life of equipment used for rescue depends greatly on the type of use and the environment of use. Because these factors vary greatly, a precise service life of the equipment cannot be provided.

When inspecting the equipment, check the webbing for cuts, worn or frayed areas, broken fibers, soft or hard spots, or discoloration. Check the stitching for pulled threads, abrasion, or broken stitches. If any damage is noted, the equipment should be removed from service.

If the equipment is dropped or impact loaded, it should be inspected by a qualified inspector prior to being returned to service. In most cases, a visual inspection will not be able to determine if the equipment has been damaged. Based on the history of the incident, if there is any doubt regarding the safety of the equipment, it should be removed from service and destroyed.

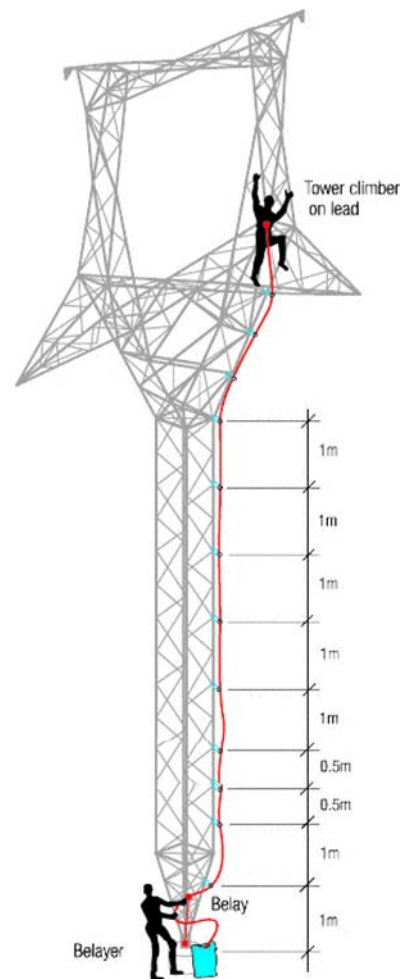
LEAD CLIMBING TECHNIQUE

Lead climbing is a fall protection technique developed by rock climbers to protect the first person up the climb. Lead climbing is a team technique with a leader who climbs first and a belayer who manages the safety line. As the leader ascends the climb, he places artificial anchors into the cracks in the rock and clips the rope through carabiners attached to these anchor points. This reduces the fall factor, increasing the survivability of a fall. The belayer pays out the rope as the climber ascends. Should the climber fall, the belayer holds the rope securely.

Fall factor is the height of the fall divided by the amount of rope in service and is an indicator of the severity of the fall. As the climber's impact force increases with the height of the fall, it decreases with the amount of rope available to absorb the energy of the fall. Fall height is determined by the climber's distance above the last point that the rope is anchored to the tower. For example, a climber one meter above the last anchor point would fall two meters before the rope would begin to arrest the fall and the fall factor would be 2.

Even with the energy absorption in the rope, a fall factor of 2 is a severe fall. For this reason, it is recommended that the fall factor for tower ascents should remain below 0.33.

This would be equivalent to a one-meter fall onto three meters of rope. To minimize the fall height, the climber attaches the rope to the tower as he climbs. If the attachments are one meter apart, the height of the fall is limited to two meters. Falls near the bottom of the tower will produce a higher fall factor because less rope is in the system to absorb energy. As the climber ascends, the amount of rope in service increases while the height of the fall is kept to two meters and the fall factor decreases.



Azzards are placed every meter as the climber ascends.

An energy absorbing rope is used to reduce the impact force of a fall. For most applications, tower climbers use a 10.5 or 11 mm climbing rope, the same as used by rock climbers. Also called a high-stretch or dynamic rope, these nylon, kernmantle ropes are engineered to stretch just enough to minimize the impact force of the fall while minimizing the distance the climber falls. A shorter arrest distance decreases the chance of the climber striking part of the structure.

LEAD CLIMBING TOWERS

Azzards provide a rapid method of setting anchor points around structural elements of the tower. Azzards are pre-rigged onto the climbing rope in order of use, allowing them to be attached using one hand. The leader's rope should be twice the height of the climb up to a total height of 40 m (130 feet), plus a few extra meters for knots. This technique using Azzards is not recommended on towers over 40 m (130 feet) in height.

OSHA limits a worker's fall height to a total distance of no more than 6 feet and limits the impact force on the climber to no more than 4 kN (900 lbf). To meet this requirement, Azzards should be placed no more than one meter apart, which means that one Azzard will be required for each meter of height of the climb, plus one additional Azzard at the start.

Start by clipping all of the required Azzards onto a short chest sling with the carabiner gates facing towards the chest. Next, thread the climbing rope through the ring at the end of each Azzard starting with the Azzard closest to the climber's front.

It is important to keep the Azzards in order and to avoid twists so that they will deploy smoothly without tangling. The last Azzard threaded will be towards the side of the climber. The climbing rope is then threaded back underneath all of the Azzards and connects to the climber's harness either by tying it into the sternal D-ring with a secure knot such as a Figure 8 Follow Through Knot or by clipping it in with a carabiner. If you choose to use a carabiner, a light aluminum locking carabiner with a minimum rating of 27 kN (6,000 lbf) is recommended.

As the leader ascends the tower, an Azzard is wrapped around the main member at the corner just above the metal lacing. Always connect the carabiner into the ring as shown, not around the web. Allow for placement of Azzards at maximum one-meter intervals up the structure. Because the fall factor is greater when the leader is close to the ground the third Azzard is placed $\frac{1}{2}$ meter above the second, and the fourth is placed $\frac{1}{2}$ meter above the third. This also helps to prevent the leader from hitting the ground if he falls near the start of the climb.



Wrap the lanyard around the structure and connect the carabiner into the ring.

Rig the active belay by placing the bottom (or running) end of the climbing rope into an auto-locking, self-actuating belay device attached to an anchor in front of the belayer. The belay station should be properly anchored in a location that allows the belayer to observe the leader. Choose the belay station

position so that a falling leader will not hit the belayer. As the leader climbs, the belayer should follow his movements by paying out rope and taking it in as it is needed. It is best not to connect the belay device to the belayer. If the leader falls, the resulting shock force on the belay rope could pull the belayer out of their belay stance. Keeping the belayer out of the system also allows the belayer to render assistance to the leader or call for help.

As stated above, the length of the rope should be equal to twice the height to be climbed plus a few meters extra. This provides enough rope for the belayer to lower the leader using the belay device if a problem develops during the ascent and the leader is not able to down climb on his own or requires a top belay to protect the down climb.

When the leader reaches his desired work level on the structure he should secure the climbing rope to an Azzard placed about one meter above his position using a middle knot such as the Butterfly Knot. This extra rope "leash" will keep the leader safely tied in and will allow him latitude in movement around his immediate work area. After this he then communicates to the bottom belayer that he is "off belay" and that the rope is tied off and will not be used until the leader down climbs the tower.

ADDITIONAL CLIMBERS

Once the leader has ascended to the work location on the tower, he can install a safety line to protect additional climbers. The same type of low-stretch or static rope as used for fall protection safety line is recommended. Kernmantle construction rope as used for rope access work may handle better than other types of construction. Connecting the safety line with a carabiner to an attachment point, preferably a D-ring at the back of the waist of the leader's harness, allows the leader to pull the safety line up the tower as he climbs. Ground personnel should manage this line to prevent any entanglement. In the event of an emergency lowering, the trailed safety rope can be used by ground personnel to guide the leader out, away from the structure while being lowered by the belayer.

The safety line is not attached to any anchors or carabiners as the leader climbs; this allows fall protection devices to follow the additional climbers. An exception exists where it is necessary to keep the safety line from entering the minimum air distance for a nearby energized high voltage conductor. A connection of the safety line to the tower may be necessary where a fall will cause the climber to swing away from the tower. The inability of the climber to regain the tower could require rescue of the fallen climber. When intermediate anchor points are used, care must be taken to make sure that the fall arrest system is not disconnected to move past the anchor point. The climber should connect to the tower when

moving the rope grab past the anchor point, or a second rope grab should be installed on the safety line.

FALL PROTECTION FOR ADDITIONAL CLIMBERS

The second, third, and other climbers can begin climbing when they are notified that the safety line has been installed. Only one climber at a time should be on the line. Slight tension on the safety line will help the rope grab slide smoothly up the rope while climbing. This can be done by hand holding or tying off the bottom of the line. Only a very slight tension is needed.

Fall protection for the additional climbers is provided by attaching a fall arrest rope grab onto the safety line and connecting it to the sternal D-ring on the climbers harness with a 23 cm (9 in) lanyard. If a work positioning rope grab is used, the lanyard must be no longer than 23 cm (9 in). The sternal D-ring connection point is commonly used for tower climbing as it helps prevent the climber from hitting the tower during a fall and makes it easier to regain the tower to continue climbing. If the fall protection system analysis determines that a fall greater than 60 cm (2 ft) is possible, a fall arrest system attached to the dorsal D-ring, and incorporating a lanyard with a personal fall arrest energy absorber, and having a maximum overall system length of 90 cm (36 in) should be used.

DOWN CLIMBING

Following clean up, all but the last worker can down climb by reversing the ascending procedure using the safety line. As they reach the bottom, the belay for the dynamic rope can then be reconnected. The last person at the top of the structure breaks down the final anchor, attaches to the climbing rope, and when the belayer is ready, begins the down climb, cleaning the tower of all Azzards and other initially-placed equipment. Azzards on the descent should be racked in order so that when the gear sling and Azzards are removed at the bottom, the equipment is ready for the next climb.

MAINTENANCE

Clean and dry this equipment after each use to remove any dust, debris, and moisture. During use, carrying, and storage keep the equipment away from acids, alkalis, and strong chemicals. Do not expose the equipment to flame or high temperatures. Store in a cool, dry location. Do not store where the equipment may be exposed to moist air, particularly where dissimilar metals are stored together.

REPAIR

All repair work shall be performed by the manufacturer. All other work or modifications may void the warranty and releases CMC Rescue, Inc. from all liability and responsibility as the manufacturer.

SAMPLE LOG

The sample log suggests records that should be maintained by the purchaser or user of rescue equipment.

Equipment Inspection and Maintenance Log			
Item _____ # _____		Date in Service _____	
Brand/Model _____		Strength _____	
Date	How Used or Maintained	Comments	Name

CMC Rescue, Inc. and Ropes That Rescue Ltd. would like to again stress the importance of training. If you are not competent at lead climbing, belaying lead climbers, working on towers or at height, or working around hazards such as energized lines, training from a competent training program is necessary to maintain an acceptable level of safety.

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