

# Ladder Safety

## Introduction/Overview

Ladders are pretty uncomplicated devices. But, unfortunately, they cause more than their share of accidents. That's not the ladders' fault. These accidents happen when people select the wrong ladder for the job, don't inspect it before using it, or get careless about how they use it.

The basics of ladder safety are a combination of a little bit of knowledge and a lot of common sense. Today we're going to go over the knowledge aspects of ladder safety so that you can apply your own common sense when you use them.

## General Hazards

People often fall off ladders, resulting in injuries that can range from bruises to broken bones.

Occasionally, the result is death. Falls account for almost 13 percent of workplace deaths and over 16 percent of workplace injuries, and ladders are involved in many of those accidents.

There are several potential hazards when you work with a ladder:

- Poor condition. If a ladder is missing parts or has parts that are not intact, it's not going to be able to support a person safely. Frequent inspections are a key part of ladder safety.
- Improper selection. Not every ladder is right for every use. You should be aware of a ladder's weight and height limits. It's also critically important to never use a metal ladder near live electrical wires. Since metal conducts electricity, you could be electrocuted.
- Improper use. Ladders are designed to get you to a higher level. They are not platforms, scaffolds, skids, or braces and should be used only for their purpose.

In addition, when you have to climb, use a ladder and not a chair, box, or other substitute.

The way you use a ladder can also promote safety or cause accidents.

## OSHA Regulations and Frequent Violations

OSHA is quite specific about ladder design, inspection, and use, and has separate regulations for portable wooden, portable metal and fixed ladders (29 CFR 1910.25, 1910.26, and 1910.27). These regulations describe everything from how far apart ladder rungs should be (1 foot) to specific "do's and don'ts" when you're working on a ladder. You don't have to be concerned about ladder design, but you should know what to look for to determine if a ladder is safe to use.

Ladders are not a major factor in OSHA violations. However, in a recent year, there were 80 violations of the standard that requires inspection of ladders, and their withdrawal from use, if they are unsafe.

## Identifying Hazards

Always inspect a ladder before you use it and include ladders in any general safety inspection. Whether the ladder is wooden or metal, check that:

- Steps and rungs are all in place, intact, free from grease or oil, have slip resistant surfaces, and are firmly attached.
- Support braces, bolts and screws are all in place and tight.
- Metal parts are lubricated.
- Rope is not worn or frayed.
- Spreaders or other locking devices are in place.
- Splinters or sharp edges are removed.
- Safety feet are in place.
- Metal ladders are not dented or bent.

If a ladder has anything missing or broken, don't use it. The ladder should be tagged as defective and removed from service by the contractor.

Don't try to fix a ladder yourself. Often they can't be fixed and have to be destroyed, but leave that for experts to decide. A ladder that has been exposed to fire or corrosive chemicals is also a candidate for destruction. Don't use it.

Make sure that ladders are stored correctly, too.

They should be kept in dry areas with moderate temperatures and good ventilation. It's best to store them standing up. But if they have to be stored lying down, make sure they're supported at both ends and in the middle so they won't sag or warp. Nothing should be kept on a stored ladder either, or it will warp.

### **Protection Against Hazards**

The first step in protection from safety hazards with ladders is to select the right ladder for the job. First, ladders are rated by how much weight they can safely hold. The weight limits include both you and any equipment you're carrying.

- I-A means it can hold 300 pounds (heavy duty)
- I holds 250 pounds (heavy duty)
- II holds 225 pounds (medium duty)
- III holds just 200 pounds (light). These are generally not for use on the job.

Check the ratings before you select a ladder.

You should also be aware that there are limits on ladder length.

- A stepladder should be no more than 20 feet high.
- A one-section ladder should be no more than 30 feet.
- An extension ladder can go to 60 feet, but the sections must overlap.

### **Ladder Setup**

Although you've used ladders numerous times, you may not be aware that there is a correct way to set one up. Following this procedure will go a long way toward preventing accidents:

- Place ladder on level surface; use wide boards under it if you're on soft ground.
- Set the feet so they're parallel with the surface the ladder rests against.
- Extend the ladder so there's at least 3 feet above the top support.
- Anchor the top and either tie the bottom or have someone hold it.
- Don't rest the ladder on a window or window sash or place it in front of a door unless it's locked or blocked.
- Position the ladder so that the distance from the ladder base to the wall is one-fourth the length of the ladder.
- Position an extension ladder before you extend it.

### **Safety Procedures**

Once the ladder is set up properly, it's up to you to use it properly so you don't get hurt. As a starter, you shouldn't use a ladder at all if you have a real fear of heights or a tendency toward dizziness or fainting.

With that in mind, here are the guidelines for safe ladder use:

- Only have one person on a ladder at a time.
- Wear shoes with clean, nonskid soles—not leather.
- Face the ladder while climbing up or down and hold the side rails with both hands.
- Carry tools up or down on a belt or with a rope or hoist, not in your hands.
- Work with one hand on the ladder, keeping your tools in a hanger or holder.
- Don't step on the top two stepladder steps or top four ladder rungs.

- Keep your body centered on the ladder so your belt buckle is between the side rails.
- Don't move a ladder while you're on it.
- Keep your own movements on a ladder slow and cautious.

**One other safety hint:**

It's best to have two people carry a ladder. If, however, you have to carry one yourself, balance the center on your shoulder. Position it so the front end is above your head and the back end near the ground.

**Suggested Discussion Questions**

1. What things should you look for when you inspect ladders?
2. How are ladders rated?
3. What do you have to keep metal ladders away from?
4. What are the key points of setting up a ladder correctly?
5. How do you determine how to angle the ladder?
6. How do you climb a ladder?
7. What do you do with your tools when climbing and working on a ladder?
8. How do you carry a ladder?
9. Are there any other questions?

**Wrap-Up**

Ladders are certainly useful, and there's no reason for them to be the cause of accidents if you check them carefully before use, set them up safely, and exercise caution when working on them. You might want to keep these points in mind with the ladders you have at home, too. Give them a careful inspection; you may find yourself checking the home center ads for a replacement when you see what you've got.

## Ladder Safety Do's and Don'ts Checklist

### Do:

- Select a ladder that's the right length and weight capacity for the job.
- Inspect ladders before use.
- Make sure rungs or steps are in good condition, have non-slip surfaces, and are free of grease and oil.
- Keep metal parts lubricated.
- Check that there are no splinters or sharp edges.
- Check that support braces, bolts, screws, etc., are in good condition.
- Store ladders in dry, well ventilated areas with moderate temperatures.
- Store ladders either vertically or horizontally with supports at each end and in the middle.
- Set up ladders on a firm level surface.
- Set ladder feet parallel to the surface it rests against.
- Anchor the ladder top.
- Have the ladder bottom tied or held.
- Extend the ladder at least 3 feet above the top support.
- Angle the ladder so the distance from the bottom to the wall equals one fourth the ladder's working length.
- Position an extension ladder before extending it.
- Wear shoes with clean, nonskid soles.
- Face the ladder when climbing up or down.
- Use both hands to climb.
- Carry tools up with a rope, belt, etc.
- Keep one hand on ladder while working.
- Keep tools in a holder while working.
- Keep between the side rails while working.
- Move slowly and cautiously on a ladder.

### Don't:

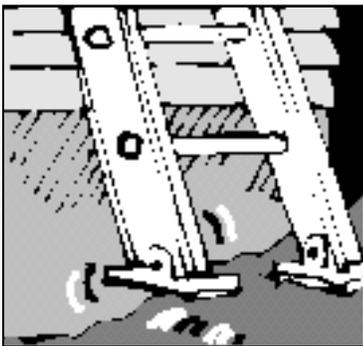
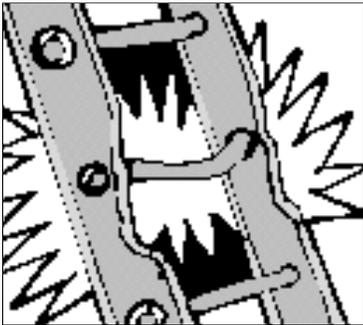
- Use a ladder for any other purpose.
- Use boxes, chairs or anything else in place of a ladder.
- Use a metal ladder near live electric wires.
- Use a ladder with missing or broken parts.
- Use a ladder with worn or frayed rope.
- Use a ladder that's been exposed to fire or corrosive chemicals.
- Store anything on a ladder.
- Rest a ladder on a window or window sash.
- Place a ladder in front of a door unless it's locked or blocked.
- Allow more than one person on a ladder.
- Climb ladders if you're afraid of heights or tend toward fainting or dizziness.
- Move a ladder while you're on it.

# Step Up to Ladder Safety

All ladders are potentially dangerous, but straight ladders, extension ladders, and special-purpose ladders can be especially hazardous because they're less stable than stepladders.

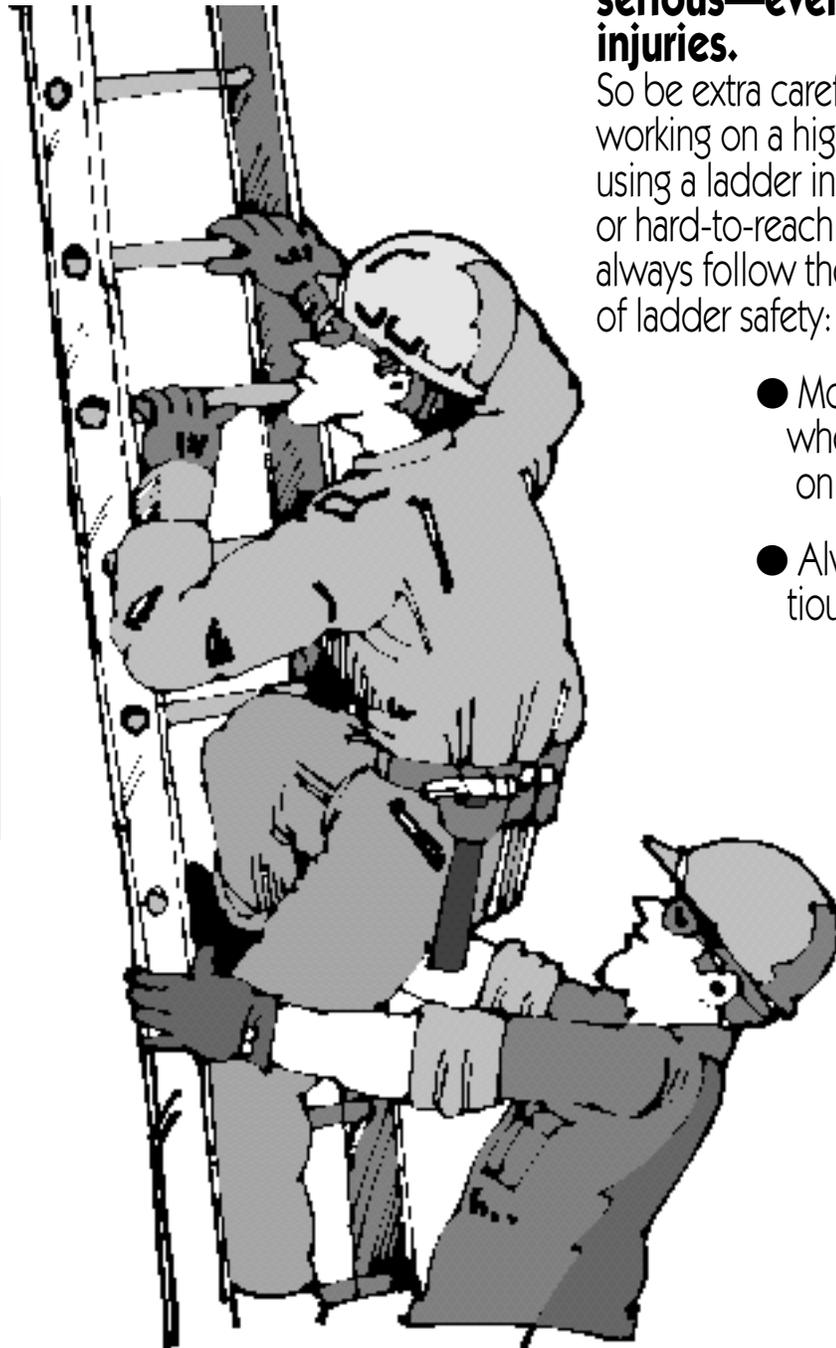
**Accidents with these types of ladders usually happen because:**

**1.** The ladder is damaged or defective



**2.** The ladder is set up improperly

**3.** The ladder is used improperly



**Remember, ladder accidents can cause very serious—even fatal—injuries.**

So be extra careful when working on a high ladder or using a ladder in an awkward or hard-to-reach spot. And always follow the basic rules of ladder safety:

- Move slowly when working on a ladder
- Always act cautiously

# How's Your Ladder Safety IQ?

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Find out with this True-False quiz.

True False

- 1.** The great thing about ladders is that they also can be used as bridges, scaffolds, and braces.
- 2.** A damaged or defective ladder should never be used.
- 3.** Leaning a straight ladder against a wall provides all the stability you need.
- 4.** A possible ladder hazard is electrocution.
- 5.** Moving quickly is the safest way to work on a ladder.
- 6.** When working on a ladder, at least one hand should hold the ladder at all times.
- 7.** Don't place a ladder in front of a doorway unless the door is locked or blocked.
- 8.** Using a wet or slippery ladder is okay if you're wearing the right kind of shoes.
- 9.** Only experienced workers should try to move a ladder while they're still on it.
- 10.** Use a belt, shoulder strap, or hoist to carry tools and equipment up and down a ladder.

# Portable Ladder Safety

## Hazard Alert



Each year, about 50 construction workers are killed by falls from ladders. More than half of the deaths occur to people working from ladders. Twice as many falls occur stepping down compared to going up ladders. The main cause of falls from straight and extension ladders is sliding of the ladder base. For self-supported ladders or stepladders, the main cause is tipping sideways. A lot of workers carrying ladders hurt their backs, too.

### Protect Yourself

- Choose the right equipment. Use ladders mainly for climbing to or from other levels. If you can – instead of using ladders to work from – use scaffolds or scissor lifts; they are safer to work from.
- Choose the right ladder length.
- A sticker on a commercial ladder tells you its maximum weight capacity. Use only type I, IA, or IAA ladders, which can support 250,300, and 375 pounds, respectively. OSHA says job-made portable ladders must be tested for strength; a regular ladder must be able to hold at least 4 times its maximum weight capacity.
- Ladder rungs, cleats, and steps must be parallel, level, and evenly spaced (10 to 14 inches for most ladders). The rungs and steps of metal ladders must be grooved or roughened to minimize slipping. Side rails must be at least 11.5 inches apart.
- Do not tie ladders together.
- If you use two or more ladders to reach one spot, they must have a platform or landing between them.
- Ladder parts must be smooth to prevent punctures or cuts or snagging of clothing.
- Wood ladders must not be painted with a coating that can hide defects.
- Employees must be trained in ladder use. A competent person must train employees in site-specific ladder safety.\*

### Setting up a Ladder

- Use 2 people to carry and set up a ladder, if possible.
- Keep all types of ladders (and tools) at least 10 feet away from live overhead power lines and other overhead obstructions. Aluminum and even wet or dirty wood or fiberglass ladders can conduct electricity.
- Set a ladder on firm, level ground. Use ladder levelers on uneven ground. Secure the ladder – tie it down, use slip-resistant feet, or have someone hold it in place. (A ladder on a slippery surface must be tied in place or held.)
- Keep the area around the top and bottom of a ladder clear. In passageways, doorways, or where traffic or other activities can occur, secure the ladder or block off the area.
- Do not set a ladder on a scaffold, box, or other object.
- **Stepladders:** All four legs must be on solid, level ground. The spreaders must be locked fully open. Never climb on the cross-bracing. Never lean a stepladder against a wall.
- **Straight and extension ladders:** The ladder base should be 1 foot from the building (or top support, such as an eave) for every 4 feet of ladder length up to the resting position. Counting rungs will give you a good estimate of the ladder length; rungs are about 1 foot apart.

(Please turn the page.)

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\* OSHA says a *competent person* is...capable of identifying existing and predictable hazards...and has authorization to take prompt measures to eliminate them. More information on ladder safety is in the OSHA Construction Standards in the *Code of Federal Regulations*, CFR 1926.1050-1060 (Subpart X).

- After you set up an extension ladder, lock the top section in place. Extension ladder sections must overlap – by at least 3 feet for ladders up to 32 feet, by 4 feet for ladders 32 feet to 48 feet, and by 5 feet for ladders 48 feet to 60 feet.
- Both rails must rest evenly on the resting spot, unless the ladder has a single-support attachment.
- When a ladder is used to get on or off a roof, secure the ladder by tying. The side rails should be at least 3 feet above the roof to be safe. Job-made ladders should let you get on or off a ladder by stepping between the rails. If you have to step around a ladder because of rungs, there should be a grab rail attached to the building to help you. (OSHA requires the grab rail and tie-off if a ladder doesn't extend at least 3 feet above the roof.) If there is a high parapet wall, use a stairway or some other way to get on or off the parapet.

### Using a Ladder

- Always check a ladder before you use it; recheck it if it has been unattended.
- Always face a ladder when using it.
- Wear shoes with slip-resistant soles.
- Always have a 3-point contact (such as, one hand and two feet).
- Keep your body centered between the side rails of the ladder – so you don't tip over the ladder.
- Never work from the top or top step of a stepladder, or from any of the top 3 steps of a straight or extension ladder.
- If you must work from an extension ladder, consider using a fall protection system attached to a secure anchor point on the building, especially if pushing, pulling, or prying. (The fall protection should be designed by a *qualified* person.\*\*) And keep both feet on the same rung.
- Do not hold objects in your hand when moving up or down or stepping on/off a ladder to an upper level. Attach objects to your tool belt or pull them up on a line after you get to your work spot.
- Do not use a ladder when it is windy.
- Never move a ladder while someone is on it.
- Lower the top section of an extension ladder before you move it.

### Inspecting a Ladder

OSHA says a ladder must be inspected regularly for visible defects by a competent person and after any incident that could affect its safe use. Check your ladder for damage before each use. If a ladder is damaged, label it, **Do not use**, and take it away until it is fixed. Destroy it if it can't be fixed.

#### Here is a checklist for inspecting ladders:

- Make sure the feet work and are not broken – and slip-resistant pads on the feet are secure.
- Inspect ladder parts for cracks, bends, splits, or corrosion.
- Check all rung and step connections.
- Make sure rung locks and spreader braces are working.
- On extension ladders, make sure the rope and pulley work and the rope is not frayed.
- All bolts and rivets should be secure.
- All rung locks and other movable parts should be oiled or greased.
- Make sure the steps, rungs and other ladder parts are free of oil, grease, and other materials.

**For more information**, call your local union, the Center to Protect Workers' Rights (CPWR) (301-578-8500 or [www.cpwr.com](http://www.cpwr.com)), the National Institute for Occupational Safety and Health (1-800-35-NIOSH or [www.cdc.gov/niosh](http://www.cdc.gov/niosh)), or OSHA (1-800-321-OSHA or [www.osha.gov](http://www.osha.gov)). Or go to [www.elcosh.org](http://www.elcosh.org)

\*\* OSHA says a *qualified person*...by extensive knowledge, training, and experience can...solve...problems related to the subject matter...

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