



# **Safety Training Topics**

June 2022

Home Improvement Ladder Safety

Boating Safety

Bonfire, Grill and Fire Pit Safety

Sun Exposure

Working Hot

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# SAFETY TRAINING TOPIC

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## Home Improvement Ladder Safety

During the summer months you are likely to undertake more home improvement projects than any other time of the year. When you are on the job there are numerous regulations and safety precautions used to help protect you from injuring yourself. Unfortunately, far too often when doing the same type of activity away from work, protections are ignored. This especially holds true when it comes to using ladders.

As a refresher, on or off the job, it is imperative that you choose the right ladder. Always read and follow any instructions, labels, markings or manufacturer recommendations and never exceed the maximum load rating of a ladder. Factor in the weight of any tools or equipment that might be used, as well.

You should always inspect your ladder before using it. If you discover slippery material on the rungs, steps or feet do not use the ladder until you clean it. Damaged ladders must be repaired or thrown away.

When positioning a ladder, it is imperative that it is placed in a location where it cannot be displaced by any other activities. Do not position the ladder on uneven or unstable surfaces or bases such as crates or boxes to obtain additional height.

If your ladder has any locking mechanisms make sure that they are engaged before climbing on it. You should also always maintain 3-point (two hands and a foot, or two feet and a hand) contact. Always keep your body near the middle of the step and always face the ladder. Avoid use the top step or rung, at all costs, unless it was specifically designed for that purpose.

Never attempt to move or shift a ladder while you are on it. Do not reach for items laterally at any point while on the ladder. These actions greatly increase the risk of a fall as a result of the ladder tipping over.

Finally, be aware of any electrical hazards that you could potential come in contact with when working on a ladder. Never use a metal ladder near power lines or exposed energized electrical equipment! If electrical work is necessary, you should use an approved non-conductive ladder.

### REVIEW AND DISCUSSION

- Why should you never attempt to move or shift a ladder while you're on it?
- What should you do if you discover slippery material on the rungs, steps or feet of a ladder?
- When is it safe to step on the top rung or step of a ladder?
- If electrical work is necessary, what type of ladder should be used?

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## Boating Safety

Hundreds of people are killed each year in recreational boating accidents. During the summer months it is likely that you and or your colleagues will be on a recreational water-vehicle. Here are some safety tips to follow if you plan on being out on the water.

First, always check local weather conditions and forecasts before taking a boat out. If you observe darkening clouds, volatile or rough waters, changing winds or sudden drops in temperature, return to shore immediately.

Before taking a boat you must inspect the vehicle to ensure that it is safe for use. You should ensure that there is a fire extinguisher on board and enough life vests for each passenger on the boat. It is also important that more than one person on board is familiar with all aspects of the boat's handling, operations and features. In the event that the operator is injured or incapacitated in any way, it's crucial that someone else can get everyone back to shore safely.

Once on the water it is imperative to use common sense. This means always operating at a safe speed (especially in crowded areas), being alert at all times and steering clear of large vessels and watercraft that may have difficulty stopping or turning. You should also always adhere to buoys and other navigational aids.

The likelihood of being involved in a boating accident drastically increases when alcohol is involved. Avoid drinking alcohol while boating at all costs. It can be deadly, not to mention it's illegal.

You should also be able to swim. A large part of safe boating means you can swim in the event your boat capsizes or you fall into the water. Familiarize yourself with any state laws and regulations, prior to operating a boat. Regardless of your state's requirements, it's always important to be educated. Consider taking a boating safety course, even if you are not required to do so.

Finally, you should also consider getting a free vessel safety check. The United States Coast Guard offers complimentary boat examinations to verify the presence and condition of certain safety equipment required by state and federal regulations. They'll provide a specialist to check out your boat and make helpful boating safety tips and recommendations.

### REVIEW AND DISCUSSION

- Why should you have more than one person on board is familiar with all aspects of the boat's handling, operations and features?

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## Bonfire, Grill and Fire Pit Safety

During the summer months you are likely to use or be around bon-fires, propane and charcoal grills and fire pits. These can all be extremely dangerous if not used properly. Here are a few safety tips to follow to prevent fires and injuries from occurring.

When using any type of grill only do so outdoors. Always have them positioned away from siding, deck railings and out from under eaves or overhanging branches. Grills must be kept a safe distance from lawn games, play areas and foot traffic. As a general rule of thumb a three-foot "safe zone" around the grill should be established. When cooking, use long-handled grilling tools to provide adequate clearance from heat and flames when using the grill. You should also periodically remove grease or fat buildup in trays below the grill to prevent fires from occurring.

In the event, you are using a charcoal grill, always purchase the proper starter fluid and store out of reach of children and away from heat sources. Never add charcoal starter fluid when coals or kindling have already been ignited. Do not use any flammable or combustible liquid other than charcoal starter fluid to light the fire.

Prior to using a propane grill, check the propane cylinder hose for leaks. You can do so by using a light soap and water solution applied to the hose. This will reveal escaping propane quickly by releasing bubbles. You must replace any damaged cylinder or hose before use,

When using a fire-pit, make sure to never use flammable fluids such as gasoline, alcohol, diesel fuel, kerosene, and charcoal lighter fluid to light or relight fires. Do not burn trash, leaves, paper, cardboard, or plywood. Avoid using soft wood such as pine or cedar that likely pop and throw sparks.

If you are building a bonfire never do so in dry conditions or if the campground and area rules prohibit fires. If there is not an existing fire pit, and pits are allowed, look for a site that is at least fifteen feet away from tent walls, shrubs, trees or other flammable objects. Also beware of low-hanging branches overhead.

When you're ready to put out your, follow these guidelines:

- Allow the wood to burn completely to ash, if possible.
- Pour lots of water on the fire; drown all embers, not just the red ones.
- Stir the campfire ashes and embers with a shovel.
- Scrape the sticks and logs to remove any embers.
- Stir and make sure everything is wet and they are cold to the touch.
- If it is too hot to touch, it's too hot to leave

Finally when being around any type of fire it is a good idea to have an appropriate rated fire extinguisher in reach!

### REVIEW AND DISCUSSION

- What should you do prior to using a propane grill?

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# SAFETY TRAINING TOPIC

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## Sun Exposure

Sun exposure is an extremely dangerous hazard that is encountered both on and off the job. It can result in sunburn and other heat related illnesses. You should be aware of what these potentially hazardous health conditions are, along with the associated symptoms and how to prevent them from occurring.

Sunburn can be painful and result in both short term and long term health complications. Though sunburn can occur year round, you are most at risk during the summer months between 10:00 a.m. and 4:00 p.m. When spending time outdoors, always protect yourself with sunscreen. You should also wear sunglasses to protect your eyes from becoming sunburned.

Skin damage caused by sunburn can occur after short periods of exposure. However symptoms typically begin to occur about 4 hours after exposure, and worsen within 24-36 hours. They may include red, warm and tender skin, swollen skin, blistering, headache, fever, peeling skin, nausea and fatigue. Your symptoms usually will last 3-5 days.

Heat exhaustion is another heat related illness that is caused by dehydration as a result of working in high temperatures or humid conditions. Symptoms of heat exhaustion include clammy, moist skin and pale complexion. These signs and indicators may also be accompanied by extreme fatigue, headache, nausea, vomiting, giddiness and even fainting.

Heat cramps can also occur as a result of dehydration. They usually occur in the calf muscles. If heat cramps become a common occurrence, seek medical attention to determine the best way to treat them. You may also experience heat rash when working in hot and humid conditions. This happens when sweat causes wet or moist clothing to rub against your skin. Heat rash can be prevented by resting in a cool place and allowing sweat to dry and wearing clothing that wicks moisture from the body.

Heat stroke is the most dangerous of all heat related injuries. When heat stroke occurs your body loses the ability to regulate its own temperature. Symptoms of heat stroke include loss of the ability to sweat, dry-hot skin, mental confusion, convulsions, delirium, and loss of consciousness or even coma. If you or a colleague exhibits these symptoms, seek immediate medical attention. If you do not seek immediate medical attention, heat stroke can cause death.

Here are a few ways to prevent sunburn and heat related illnesses:

- Wear a hat that allows air circulation around your head
- Wear sunscreen on exposed skin and parts of the body subject to the sun
- Drink plenty of fluids throughout the day
- Avoid caffeine, alcohol and very cold drinks

### REVIEW AND DISCUSSION

- When are you at the highest risk of sun exposure?

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# SAFETY TRAINING TOPIC

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## Working Hot

### Why This Is Important

Every time you work on energized circuits you risk an arc blast or electric shock. If you take the necessary precautions, you can eliminate the risks.

### The Potential Harm

Temperatures generated by short-term contact with a circuit even as low as 120V can be 10 times higher than what it takes to cook your tissues. It takes very little electricity to electrocute you. The amount of current it takes to light a 75W lamp is past the threshold of what it takes to cause fibrillation. When you think of fibrillation, think of your heart being rendered useless.

Electrocution burns take place from the inside out.

Contact time is an important determinant in the severity of damage. The less time, the better. Other factors that determine the severity of damage include voltage, resistance, frequency, and victim characteristics such as age, physical condition, and size, plus some environmental factors.

### Shock Characteristics

At 60 Hz, AC shock produces a tingling sensation that ranges from slight to violent. DC shock produces a warmth sensation that ranges from warm to burning hot. When current through your body reaches a certain point, it paralyzes your arm muscles so you can't let go. This is what people are talking about when they refer to "let-go current."

The let-go current threshold decreases as frequency increases. It takes less current to pass the let-go threshold when you are working on a 400 Hz UPS than when you are working on a 60Hz system.

### Shock Current Path

The path the current takes through your body can determine whether you survive or not. That's why we take measurements with one hand on the probe and one hand in a pocket, rather than with both hands on probes and a path established across the heart.

That's why we also try to eliminate pathways between feet and hands. Your heart is on your left side. Thus, if you must choose a path that includes a hand and a foot, choose the right hand and foot rather than the left hand and foot.

### Preventing Electric Shock

Working on de-energized circuits is an obvious way to prevent shock, but it depends on proper lockout/tagout, proper testing for voltage, and using safety grounds. Non-compliance with the requirements for ensuring circuits are de-energized is rampant, and the body count from non-compliance is high.

Using the appropriate PPE and following hot work procedures is your first line of defense, not your last.

### Electric Arc Blast Characteristics

The heat from an electric arc can reach temperatures four times as hot as the surface of the sun. The pressure wave generated by an arc fault can hurl you away from the heat source, but usually causes other injuries also. In worst case scenarios, the pressure wave acts like a giant hammer. The pressure waves are sometimes strong enough to level concrete walls.

### Protection From Flash

Wear the required PPE, such as a flash suit, hood, and face shield.

Wear clothing resistant to flash flame wherever exposure to an electric arc flash is possible. In the several seconds it takes to remove clothing or extinguish flames, you can be subject to deep and possibly fatal burns.

Reduce the likelihood of arc faults to begin with. For example, make test connections one lead at a time to prevent creating an ionized path that completes a circuit between an energized terminal and ground. Another way is to remove as many loads from the equipment as possible before working on it.

## **REVIEW AND DISCUSSION**

- Why is it important to know the principles of working hot?
- What are the characteristics of AC shock?
- What are the characteristics of DC shock?
- What is let-go current? Regarding hands and feet, what is the proper way to take measurements, and why?
- What is your first line of defense for preventing electric shock?
- How hot can an arc blast get?
- Is the pressure wave from an arc blast powerful? How so?
- What are some clothing and PPE issues, in regard to arc flash and arc blast?
- How can you prevent an arc fault in the first place?