

Over the Edge

A quarterly publication for injury and illness prevention

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Hand Tool Safety

The large variety of hand and portable power tools available on the market today is mind boggling. These tools allow us to work faster and increase the number of different jobs that we can accomplish. However, if used improperly, hand and power tools can cause injury. By using protective equipment, and following proper work practices, you can operate hand and power tools safely and with confidence.

Personal Protective Equipment. The type of personal protective equipment (PPE) you need when using hand tools depends on the tool being used.

- At a minimum, eye protection—in the form of safety glasses or goggles—must be worn at all times. The simple act of snipping copper wire with a side-cutting pliers, striking a nail with a hammer or sawing wood can propel small pieces of debris into the air.
- It is also important to protect your hands from cuts, abrasion and repeated impact. Cut-resistant gloves made of Kevlar®, or stainless steel can help protect against the effects of a misplaced blade. Wearing standard cotton or leather gloves can help prevent wood splinters or skin abrasions from handling lumber. Impact-resistant gloves with gel or rubber palms can reduce vibration.
- Safety shoes with a reinforced toe can help protect your feet from injury caused by a dropped tool.



Wrenches come in an endless variety of styles such as socket, open-end, combination, adjustable and torque, just to name a few. Wrenches are designed to turn or hold bolts, nuts or multiple-threaded fasteners. They are sized to keep the leverage and load in an acceptable balance.

- Choose a wrench that properly fits the fastener you wish to turn. Use metric wrenches for metric bolts and American inch wrenches for inch-sized bolts. By using the correct size, the wrench is less prone to slip or round off the fastener corners.
- Avoid using an extension to improve the leverage of a wrench.
- Do not use open-end or adjustable wrenches for final tightening or loosening frozen fasteners. These wrenches do not have the strength of a box-end or socket wrench.
- Apply penetrating oil on frozen fasteners before using a wrench.
- Do not expose a wrench to temperatures that could weaken tool hardness.
- Always try to pull on a wrench (instead of pushing) in case the fastener loosens.
- Adjustable wrenches must be adjusted tightly to the fasteners and then pulled, putting the force on the fixed end.

- Turn power off and use electrically insulated wrenches when working on or around electricity.
- Never alter a wrench.
- Do not over torque a fastener. Use a torque wrench to tighten the fastener to the exact torque required.
- Inspect wrenches periodically for damage, such as cracking, severe wear or distortion.

Pliers come in all shapes and sizes, such as lineman, diagonal cutting, needle nose, slip joint, locking tongue and groove. Plier uses include gripping, cutting, turning and bending. Pliers are a versatile tool, but must be used according to how they are designed.

- Do not increase a plier's handle length to gain more leverage, instead choose larger sized pliers.
- Never subject pliers to temperatures that could decrease tool hardness.
- Cut hardened wire only with pliers designed for that purpose.
- Do not substitute a pliers for a wrench when turning nuts and bolts.
- Be sure the plier's jaws can grasp properly when bending rigid wire.
- Do not hammer with pair of pliers.
- Cut wire at right angles without bending wire back and forth against the cutting edge of a pliers.



Hammers are one of the most used tools in our tool boxes. (Unfortunately, they are also the most abused tool.) Nail, soft-face, ball-peen, chipping, sledge and setting are just a few of the hammers we use in the workplace and home. Each kind of hammer has a head that is tailored to work best for a particular application. Recently, even hammer handles have been improved to be stronger, ergonomically shaped and transmit less shock to the user.

- Always use a hammer of the proper weight and size for the task. Do not use the wrong hammer for the job; match the proper type of hammer to the task it is designed to perform.
- Do not strike the surface at an angle. The hammer face should contact the striking surface squarely, so the two are parallel.
- Do not use a hammer if the handle is damaged or loose.
- Use a hammer face that is 3/8" larger in diameter than the striking tool.
- Never weld, heat or regrind a hammer head.
- Remove from service any hammer exhibiting signs of excessive wear, cracks, mushrooming or chips.



Screwdrivers are intended for turning a variety of threaded fasteners, such as machine or wood screws, in or out of materials. Screwdriver tips come in a variety of different shapes and sizes. The slotted and Phillips © tips are the most common, however, hex, square and various others are also used. As with any tool, it is important to

match the type of screwdriver you use to the type of job you're doing.

- Never use a screwdriver as a pry bar, chisel, punch, stirrer or scraper.
- Always use a screwdriver tip that properly fits the slot of the screw.
- Throw away screwdrivers with broken or worn handles.
- Never expose screwdrivers to temperatures that could reduce tip hardness.
- Turn power off and use electrically insulated screwdrivers when working on or around electrical components.
- Straighten tips or redress rounded edges with file.
- Never use pliers on a screwdriver for extra leverage. Only use a wrench on screwdrivers specifically designed to accept them.
- Use magnetic or screw-holding screwdrivers to start fasteners in tight areas.
- Use both hands when using a screwdriver—one guide the tip and the other to turn the handle. Final tightening requires both hands on the screwdriver.



Back Injury Prevention

Proper posture, conditioning and body mechanics are the key components of any program designed to prevent back injuries. Up to 80% of Americans will suffer back pain at some point in their lives. The cause of back pain in about 90% of cases is strain or sprain of back muscles, ligaments or soft tissue. These conditions generally heal completely, but often recur if prevention strategies are not used. Back injury may be prevented – or treated – with proper posture, conditioning and body mechanics.

Posture. Proper posture includes standing and sitting in an upright position without slouching, rounding of the shoulders or accentuating the natural curves of the spine. Poor posture typically involves holding the head too far forward or allowing the belly to pull the back forward.



- When standing, bend your knees slightly. Poor posture can lead to weakened spine and abdominal muscles and contributes to back pain.
- Proper sleeping posture is also important to prevent and relieve back pain. Sleep on a mattress that is firm, not sagging, but not too hard. Do not sleep on your stomach. Instead, sleep on your side with a pillow between your knees or, sleep on your back with a pillow under your knees.

Conditioning. Proper conditioning involves overall conditioning of the body and cardiovascular system with aerobic exercise, as well as strengthening and stretching core muscles of the spine and abdomen. Studies have shown that smoking can contribute to back pain and injury, so if you still smoke, you have yet another reason to think about quitting. Walking,

swimming, bicycling and, for some people, slow, short-distance running are excellent ways to condition the entire body and improve cardiovascular health. In addition to improving general levels of health and fitness, these activities increase blood flow to the spine.

- Aerobic activity, along with a healthy diet, helps prevent weight gain, which is a risk factor for back injury. To begin exercising, try walking for 10 minutes twice per day at a moderate pace and build up to at least one 30-minute walk per day.
- Stretching to increase back and abdomen flexibility should be done 5-7 days per week.



Body Mechanics refers to the way we use our bodies to complete various tasks during activities of daily life. When lifting, bending or stretching, we should think of how we are using our back to avoid provoking an acute injury. There may be a simpler, less strenuous method or posture that can be used to get something done. Ask for help.

- Instead of bending at the back to pick something up off the floor, stoop down at the knees. Keep the back as straight as possible and maintain proper posture. Instead of reaching overhead, use a sturdy stepstool. Push or pull with your entire body, not just your arms. Wear comfortable, low-heeled shoes.

When lifting,



- Avoid reaching too far out for the object to be moved; instead, stand close and grasp the object close to the body.
- Maintain proper posture with back straight and head up. Bend at the knees and hips, not at the back or waist, and use your legs to lift. Pivot at the hips, not the back. If possible, lift from a tabletop or from waist height, rather than from the floor or over your head.

When working, whether sitting or standing, pace your activities and take frequent breaks. Vary the position of your body when standing. Stand on a cushioned mat, if possible. When sitting at a desk, think in terms of right angles (90°, or the shape of an L). Knees should be at 90° angles when the soles of the feet are touching the floor. The back and thighs should form 90° angles when the body is sitting properly in a chair. Wrists should be straight and elbows at 90° angles when the hands are on the desk or keyboard.

A healthy lifestyle – attention to posture, conditioning and body mechanics, avoiding obesity and smoking, and minimizing emotional stress – will take you a long way toward maintaining a healthy back.