

## LADDERS



Ladders should only be used when other forms of working at heights are not feasible. A fall from a ladder can be very serious, and basic safety guidelines should be taken to avoid this.

### Select the Right Ladder for the Job

- Never use a metal or metal-reinforced ladder if working near electrical wires or equipment; use a wooden or fibreglass ladder.
- Choose a ladder with the proper duty rating to support the combined weight of the user and any materials.
- Choose a ladder that is long enough to safely reach the desired height.
- Straight ladders should have safety feet.

### Inspect the Ladder Before Use

- Make sure that the ladder is in good physical condition, and that there are no missing or damaged parts. Check the condition of the rungs, the safety feet, braces, nuts and bolts, and so on.
- Make sure that the base of the ladder is level and solid. IF the ground is uneven, shore up the legs. This means making the ground more solid or even.
- Make sure that the ladder rungs are clean. They should be free of mud, snow, oil, grease or any other slipper substances.
- Make sure that your shoes are also safe for climbing. If they are wet or muddy, you can slip.
- Face the ladder when ascending or descending.
- Maintain three point contact at all times when working. This means two feet and one hand or one foot and two hands should always be in contact with the ladder.

### Position the Ladder Safely

- Use the 4 to 1 rule. Position the base of the ladder one foot away from the wall for every four feet of ladder height.
- A straight ladder should extend at least 3 feet past its upper support point.
- Secure the ladder from movement if needed. Tie down the ladder as close to the support point as possible.
- If the ladder is located close to a door, make sure that the door is locked to prevent collisions.

### General Guidelines for Climbing the Ladder

- Work with a partner whenever you can. Your partner can hold the bottom of the ladder when you climb up or come down. Only one person is allowed on the ladder at a time.

- Face the front of the ladder when climbing up or down. Use both hands while climbing and maintain a firm grip.
- Avoid twisting or turning on the ladder; this makes it easier for you to lose your balance.
- Do not stretch or reach out beyond the side rails of a ladder; you could lose your balance.
- Do not stand on the top 2 rungs of the ladder.
- Do not carry up equipment while you climb; pull these materials up to you after you have reached the top or have a co-worker pass them to you. Wear a tool belt if you need to carry tools while you are on the ladder. Carry only the tools that you need for that particular job.

#### **Step Ladders**

- If you are using a step ladder, spread its legs to the limit and then lock the spreaders. Make sure it is locked in place before climbing the ladder!
- Do not stand on the top 2 rungs of the ladder.
- Do not climb, sit or stand on the spreader braces, ladder top, or pail shelf.

For further details, consult the University of Toronto - Working at Elevated Places - Portable Ladders Standard - Selection and Use.

## **MACHINE GUARDING**

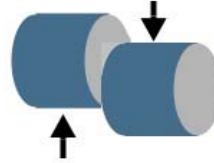
Moving machine parts have the potential for causing severe workplace injuries due to hazards created by hazardous motions and actions. Many of the tools and equipment you use in your daily jobs have the following hazards of which you should be aware:

### Shear Points:

Shear points are created when the edges of two objects move to cut material.

Stay clear of shear points when the equipment is operating!

Shut off all power when adjusting or cleaning equipment with shear points.



### Crush Points:

Crush points are created when two objects move toward each other.

Avoid placing body parts between objects that are moving toward each other.



### Pinch Points:

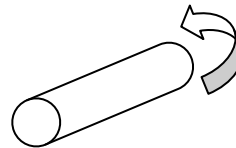
Pinch points are created when two objects move together, with at least one of them moving in a circle. Pinch points can be found in belts, gear drives, chains and elevators.

Avoid placing body parts near pinch points.



### Wrap Points:

Wrap points are created around rotating machine components. Injuries usually occur when loose clothing or hair catch and wrap around rotating shafts. Protruding shaft ends can also become wrap points.



The above hazards exist in three main areas:

- 1) The point of operation on a machine where work is performed on the raw material and where actions such as cutting, shaping, boring or forming takes place;
- 2) The power transmission apparatus which includes mechanical components which transmit energy to the part of the machine performing the work (e.g. gears, cams, shafts, pulleys, belts, flywheels, cranks, clutches, chains, connecting rods, couplings, and spindles); and
- 3) Other moving parts of the working machine (e.g. reciprocating, rotating and transverse moving parts, moving belts, meshing gears, cutting teeth, feed mechanisms, auxiliary parts and any parts that impact or shear).

Workers have the responsibility to:

- Use machine guards properly and keep them securely in place when performing tasks or working in an area where mechanical hazards exist;
- Follow proper safeguarding procedures; and
- Maintain machine guards and devices in good condition, and report defective or missing guards to the supervisor.

4) **Power Take Off (PTO):** Serious injuries have occurred from clothes, hair, shoelaces, etc. becoming caught (entanglement) in the Power Take Off (PTO).

- Make sure the Master Shield, the Driveline Shield and other guarding are in place. Do NOT modify these protective devices.
- Disengage the PTO, apply the parking brake, turn OFF the engine and remove the key before getting off.
- Do NOT step across a rotating PTO driveline.
- Reduce PTO shaft abuse: avoid tight turns that pinch rotating shafts between the tractor and the machine; keep excessive telescoping to a minimum; engage power to the shaft gradually; and avoid over tightening of slip clutches.
- Be aware of your clothing, shoe laces and hair. Wear snug fitting clothing
- For further details, consult the University of Toronto – Machine Guarding Standard.

## MANUAL MATERIALS HANDLING



Back injuries are a leading hazard both in the workplace and at home. Approximately 80% of people will suffer from back pain at some point during their life. We often do not think about how easy it is to hurt our backs, until it happens.

Back problems do not usually happen because of just one single event. Usually, they result from factors like poor posture, improper lifting techniques, or repeated misuse. Be aware of the various ways you can hurt your back when lifting at work or at home. For example, you increase the likelihood of hurting your back if you use poor lifting techniques, if you are in poor physical condition, or if your workplace is not designed properly and you need to reach, pull, twist or bend when you lift.

### A. Risk Factors for Lifting Injuries

Let us look at the main factors that contribute to back injuries:

#### 1. The Object Being Lifted:

- **Weight.** The heavier the object, the greater the load on the spine and the higher the risk of injury. If a load is heavy, use a mechanical aid (pushcart, trolley, etc.) or ask for help. Or, separate heavy loads into lighter loads to reduce the risk of injury. **Always test the weight of the object before you try to lift it.**
- **Shape.** Avoid large objects that extend the arms and block your vision. Smaller objects can be lifted properly and more easily. Ask for assistance. For larger loads, divide the load into two lighter loads and make two trips or ask for assistance.
- **Centre of Gravity.** Avoid objects with lopsided weight or loose contents. If this is not possible, use a mechanical aid or handle it with care. Keep the object close to the body. The farther away the object is held from the body, the more weight is placed on the spine. When dismantling an object for transport, ensure you understand the centre of gravity for each component as it may be different from when all the components are together.
- **Labeling.** Read the label to see what the total weight of the object is, and whether the object contains dangerous substances.
- **Grip.** Objects should be easy to grasp. Handles should be large enough to accommodate the full hand, so that a power grip rather than a hook grip is used. A pinch grip requires the tool to be

grasped between the index finger and the thumb for precise manipulations. When a pinch grip is used intensively and for a long duration, fatigue may occur in the hand and forearm muscles.



Power Grip



Hook Grip



Pinch Grip

## 2. The Task:

- **Work Posture.** Avoid unnecessary static posture or lifting from an awkward position. Maintain your back in a neutral position. Proper workplace design can eliminate this problem. **Stretch periodically to give your back a break.** For example, avoid awkward attempts at lifting large pieces of furniture on your own. Instead, ask one or more of your coworkers to assist you.
- **Height of Start and Placement.** Objects should also be stored below shoulder and above hip height to reduce reaching above the shoulder and to reduce bending. Avoid lifting above shoulder height by using an adjustable platform.
- **Carrying distance.** Keep carrying to a minimum. Use mechanical aids such as conveyors or carts to move objects large distances. Efficient layout will reduce the carrying distance.
- **Repetition, rate and duration.** More stress is placed on the back:
  - The more times you have to lift;
  - The faster you lift; and
  - The longer you lift.For example, landscaping may involve extended and repeated periods of reaching. It is therefore important to stretch periodically to give your back a break.

## 3. The Environment:

- **Temperature.** Excessive heat and extreme cold can increase the risk of injury. If you work in a hot environment, you can overexert

yourself or succumb to some heat-related illness. When muscles are cold, flexibility and dexterity are reduced. If you also need to wear heavy, bulky clothing, your movement will be restricted.

- **Lighting.** Lighting is important to see the work area and the object being handled. It also allows the worker to see dangers in the workplace, such as a wet floor, a falling object or an obstacle in the path. The light should be sufficient to see changes in floor level and texture.
- **Obstacles/slippery surfaces.** It is good work practice to regularly inspect the work area and identify and remove slip, trip and fall hazards.

#### **4. The Worker:**

- **Strength.** Inadequate muscle strength can lead to faulty body mechanics and back injuries. If the muscles in your arms or legs are weak, you sometimes make up for it by using your back muscles, which are relatively weak muscles.
- **Physical Fitness.** Poor physical condition can increase the risk of injuries. Regular exercises such as walking, swimming or biking will help you to keep fit.
- **Training.** Lack or inadequate training on lifting techniques can result in improper lifting and eventually back pain and injury.
- **Age.** According to the Canadian Center for Occupational Health and Safety, ageing diminishes strength. However, since the rate of decline varies greatly with the individual, discrimination against older workers due to age alone is unjustified. In fact, statistics show that back injuries among workers over 45 years of age are less frequent than among those between 20-45 years of age. This is due to the link that in general, older workers tend to be more experienced with their jobs thus equipping the older worker with skills, dexterity and practical know-how for completing tasks. The unskilled, inexperienced worker is at greater risk in tasks that require skills in handling. On the other hand, the older, experienced worker is at risk in tasks requiring sheer physical strength.

#### **B. How To Lift Safely**

Proper lifting techniques can help you keep your back healthy and prevent back pain and injury. There is no single lifting technique that will work in all situations.

#### **Before You Lift:**

- Ensure you are wearing CSA approved safety shoes and using leather work gloves.
- Examine the load and check overall conditions. Test the load. Decide where and how to hold it. Check to see if the load has any sharp edges, or if it is slippery, too hot or unevenly balanced.
- Clear your path of any obstacles or tripping hazards. Make sure that you can fit through narrow spaces.
- Make sure your footing is solid. Your shoes should give you good balance, support and traction.

#### Performing the Ideal Lift:



- Stand close to the load.
- Place your feet shoulder width apart to give you good balance.
- Bend your knees, keeping your back comfortably straight.
- Grip the load firmly. Make sure that you can hold it securely, without slipping.
- Lift with your legs, slowly straightening them to a standing position. Maintain your back in a neutral position.
- Keep the arms and elbows close to the body when lifting. Hold object firmly and close to your body.
- Lift smoothly using controlled movements. Move your feet if you must turn while lifting; do not twist your body.
- To lower the load, bend the knees. To place load on a bench, shelf or table, place it on the edge and push it onto position. Make sure that your fingers are out of the way when you set the object down.

Image from <http://www.ccohs.ca/images/MMH059.gif>

#### Lifting Do's and Don'ts:

- DO test the load and check overall conditions.
- DO perform a pre-job analysis to identify potential hazards.
- DO keep the object close to the body.
- DO place your feet shoulder width apart to give you good balance.
- DO use your legs to lift.
- DO maintain the natural curve of your back (neutral position).
- DO use smooth controlled movements.
- DO take breaks and stretch the back.
- DON'T lift unreasonably heavy or awkward loads.
- DON'T bend forward for prolonged periods.
- DON'T lift in front of one knee or to one side of the knee.
- DON'T rotate or twist your back while lifting. Turn with your feet and not your waist.



- DON'T use rapid or jerky movements.
- DON'T lift asymmetrically/one-sided.

**NEVER** try to lift a load that is too heavy, too large, or too awkward for you to handle! Instead, you should:

- Use a materials handling aids (pushcart, hoist, dollies, etc.) whenever possible.
- Ask others for help.
- Divide the load into separate pieces if possible.
- Your supervisor in conjunction with the Office of Environmental Health and Safety can schedule training on Manual Materials Handling.

Examples of materials handling aids:



Raise and roll



Trolleys



Hydraulic Lifts



Pallet Trucks



Lift Table



Tailgates



Wheel Barrel



Bins

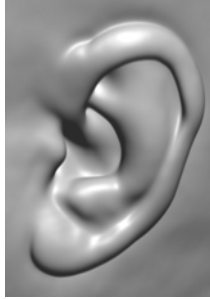


Hand trucks

**References:**

- 1) Section 45 of the Regulation respecting Industrial Establishments, made under the Ontario Occupational Health and Safety Act.

## NOISE



Exposure to harmful levels of noise can happen when using noisy equipment such as chainsaws and lawn mowers. Long-term noise exposure over many years can contribute to permanent hearing loss, which cannot be cured by medical treatment.

Some indications that your work environment is too loud are:

- Sounds are muffled.
- You hear a ringing sound in your ears after a long exposure
- You have a difficult time hearing somebody who is standing close to you
- Your ability to hear decreases at the end of the work shift but returns to normal the next morning

The loudness of noise is given in dB(A). Some common sounds are given below:

Wood Chipper	100 - 110 dB(A)
Lawn Mower	95 - 110 dB(A)
Power Mower, Snowmobile	95 - 105 dB(A)
Chain Saw	95 - 105 dB(A)
Sidewalk Snow Plow	90 - 100 dB(A)
Salt and Sand Truck	90 - 100 dB(A)
Vacuum Cleaner	80 - 85 dB(A)
Normal Conversation	60 - 65 dB(A)
Whisper	30 - 40 dB(A)
University of Toronto Maximum Permissible Exposure to Noise Without Hearing Protection	85 dB(A) over eight hours

### Prevention:

Your employer is responsible for controlling the noise in your workplace. If it is not possible to reduce the noise to safe levels, then your employer must protect you from the noise. This may be carried out by reducing the time you spend in noisy areas, or by providing you with the proper hearing protection.

- Let your supervisor know about any noisy equipment, and if you experience temporary loss of hearing, headaches, or ringing in the ears during or at the end of your work shift.
- Noise training will be scheduled by your supervisor in conjunction with the Office of Environmental Health and Safety.
- Hearing audiometric tests are available through Health and Well-Being Programs and Services for employees working in areas with

recognized noise hazards. Your supervisor must arrange for you to have your baseline audiometric test within the first two weeks of your employment.

**References:**

- 1) Regulation respecting Industrial Establishments, made under the Occupational Health and Safety Act.
- 2) University of Toronto Noise Control and Hearing Conservation Program.
- 3) University of Toronto Hearing Protection Standard – Selection and Use.

## CONFINED AND RESTRICTED SPACES



A confined space means a fully or partially enclosed space, that is not both designed and constructed for continuous human occupancy, and in which atmospheric hazards may occur because of its construction, location or contents or because of work that is done in it.

**“Acceptable atmospheric levels”** means that,

- the atmospheric concentration of any explosive or flammable gas or vapour is less than,
  - 25% of its lower explosive limit, if the worker is performing only inspection work that does not produce a source of ignition,
  - 10% of its lower explosive limit, if the worker is performing only cold work and,
  - 5% of its lower explosive limit, if the worker is performing hot work and is following appropriate procedures,
- the oxygen content of the atmosphere is at least 19.5% but not more than 23% by volume,
- exposure to atmospheric contaminants does not exceed any applicable level set out in a regulation made under the Occupational Health and Safety Act.

Entry into confined spaces or restricted spaces can be potentially hazardous if appropriate procedures and practices are not followed. Your supervisor will inform you of workspaces classified as confined or restricted, and the procedures and precautions you must follow when working in such areas. In addition, there are signs posted pointing out confined and restricted spaces. Make sure not to enter these areas until you have made sure of the following:

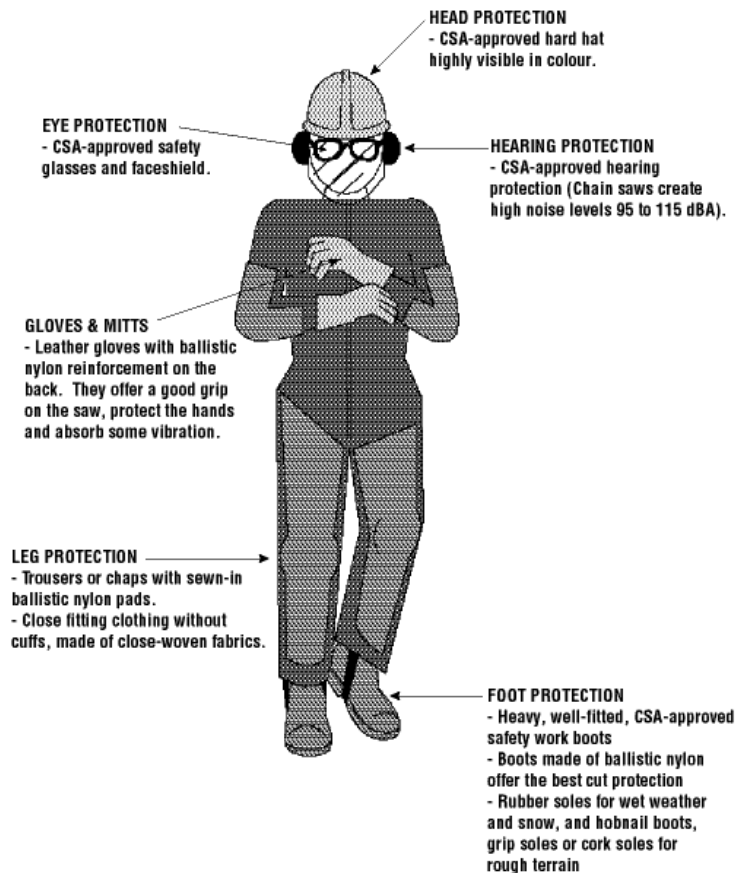
- Confined and/or restricted spaces training will be scheduled by your supervisor in conjunction with the Office of Environmental Health and Safety.
- Confined spaces require an entry and work permit.
- Confined spaces are classified according to the need for respiratory protection.
  - Class 1 confined spaces cannot be entered without proper respiratory protection. Workers entering Class I confined spaces must wear appropriate respiratory equipment,

- usually Self Contained Breathing Apparatus (SCBA) or Supplied Air Respirators (SAR)
- Class 2 confined spaces do not require the use of respiratory protection.
  - Restricted Spaces (UofT) is a space which is fully or partially enclosed, that is not both designed and constructed for continuous human occupancy, but in which atmospheric hazards are neither present nor likely to occur.
    - Restricted Space entry must be performed using the buddy system, along with a reliable means of communication in place.

**References:**

- 1) University of Toronto Confined Space Program
- 2) University of Toronto Restricted Spaces Standard

## PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR GENERAL SAFETY



[http://www.ccohs.ca/images/H06\(1\).gif](http://www.ccohs.ca/images/H06(1).gif)

Personal protective equipment (PPE) is any equipment or clothing which you have to wear to protect you from possible hazards in the workplace, such as chemicals, noise, sharp objects, flying particles, extreme temperatures or electrical hazards. Your supervisor will ensure that efforts are made to control hazards at their source; however, there will be situations when you will be required to wear personal protective equipment.

All personal protective equipment should be in accordance with the standards as identified in the applicable Regulations, Canadian Standards Association (CSA) and University of Toronto Standards and Procedures.

All personal protective equipment should be inspected regularly for damage, and repaired or replaced when defects are found.

Examples of PPE that you may use include:

**Sun Protection:**

- Wear long or short-sleeve shirt and pants made of tightly woven fabric (e.g. cotton) to protect your skin.
- Generously apply SPF-15 or higher sunscreen to protect your exposed skin.
- Wear a hat / visor to protect you from the sun's glare and heat.
- Wear appropriate sunglasses to protect your eyes from ultraviolet radiation.

**Head Protection:**

- Wear a CSA approved hardhat when working around tree branches or falling objects.
- Inspect and maintain your hard hat for cracks, dents, etc each time before you work.
- Does your hard hat fit? There should be a one-inch clearance between the hard hat's outer shell and your head. This is so that the hard hat's suspension system can properly absorb a blow.

**Eye Protection:**

- Wear CSA approved safety glasses to protect your eyes from debris.
- Ensure your safety glasses fit properly. People's eye size, nose bridge size, and temple length are different from person to person.
- Clean your safety glasses daily by following the manufacturer's instructions. Take special care not to scratch the lenses while you clean.
- Regular prescription glasses cannot be worn as eye protection. If you require prescription safety glasses, complete the UofT "Request for Prescription Spectacle-Type Safety Glasses Form": <http://www.ehs.utoronto.ca/Assets/ehs3/forms/request+for+safety+glasses+form.pdf>

Prescription safety glasses meets Canadian Standard Association (CSA) standard Z94.3.1 and this information is imprinted on the frame.



**Air-Purifying Respirators:**

- If you are required to wear a respirator, you must be fit-testing for the exact brand, model and size. Fit-testing is done by the Office of Environmental Health and Safety and should be conducted at least every 2 years, more frequently if your face has changed to affect the seal (e.g. dental surgery, rapid weight loss or gain).
- Air-purifying respirators can be used to protect against airborne contaminants such as dusts, mists, fumes, smokes, aerosols, gases and vapours.
- The general categories of air-purifying respirators are:
  - Particulate (Dust, fume and mist)
  - Gas and vapour
  - Combination
- Selection of the most appropriate air-purifying respirator and cartridges/filters depends on factors such as the frequency of use, the type of contaminants and the anticipated concentration of those contaminants.
- Any worker who is required to use a respirator must be trained with respect to the limitations of that respirator, as well as: proper fit, inspection, maintenance, cleaning and storage. For further details, consult the University of Toronto Respiratory Protection Program.

**Hearing Protection:**

- When noise levels are high, wear CSA approved earplugs, earmuffs, or both.
  - Earplugs are inserted to block the ear canal.
  - Earmuffs fit around the ear and are held together by a headband.
- Do not use radio headsets as a substitute for hearing protection.
- Do not modify your hearing protection.
- Wash your hands before inserting or removing earplugs to prevent contamination of the ear canal. Some earplugs have a push-in design which reduces handling of the part that goes into the ear.

**Hand Protection:**

- Choose the right glove for the hazard (e.g. cuts, scrapes or chemical hazards)
- Make sure your gloves fit your hands properly.
- When working on machinery or powered equipment, always remove your gloves to avoid getting your fingers pulled into blades and chains.
- Practice good hygiene. Even if you wear hand protection, wash your hands prior to eating, drinking, smoking, etc. This is particularly important if you have been handling chemicals or soil which contains bacteria and fungus.

**Foot Protection:**

Safety footwear protects your feet against impact, compression, and puncture to the foot. Also, many injuries are caused by workers slipping on wet grass and steep inclines.

- Choose CSA approved footwear only, making sure that it has the proper rating for the hazard as well as the proper sole for the working conditions.
- Lace up boots fully. The support can help reduce ankle injuries.
- OUTDOORS only: wear anti-slip footwear provided by the department