Machine Guarding

Dangerous Motions & Actions

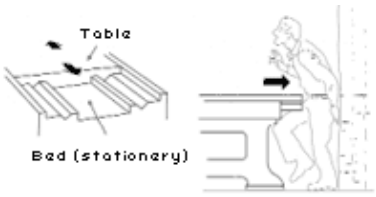
It is a fact that contact with moving machinery can cause severe and tragic injuries. Injuries that some people would attribute to dangerous work, like amputated fingers and limbs are often caused from contact with moving machinery. For the purpose of this Toolbox Talk, Machine Guarding will be used to describe all guards, devices, and controls used to protect employees from the dangers of moving parts.

Hazardous Machine Parts

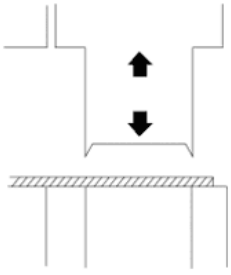
To fully understand the importance of Machine Guarding first identify the types of motions and action that can lead to injury from machinery.

Rotating is circular motion such as action generated by rotating collars, couplings, cams, clutches, flywheels, shaft ends, and spindles that may grip clothing or otherwise force a body part into a dangerous location.

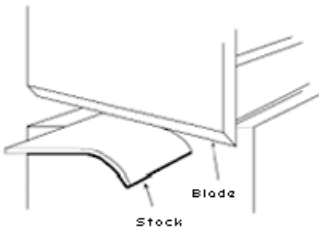
Reciprocating is back-and-forth or up-and-down motion that may strike or entrap an employee between a moving part and a fixed object.



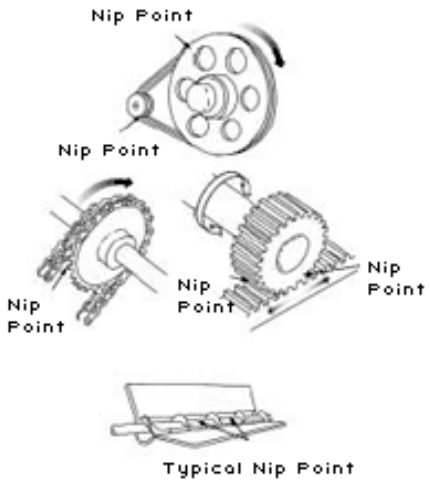
Punching Action begins when power causes the machine to hit a slide (ram) to stamp or blank metal or other material. The hazard occurs at the point of operation where the employee typically inserts, holds, or withdraws the stock by hand.



Shearing Action involves applying power to a slide or knife in order to trim or shear metal or other materials. The hazard occurs at the point of operation where the employee typically inserts, holds, or withdraws the stock by hand.

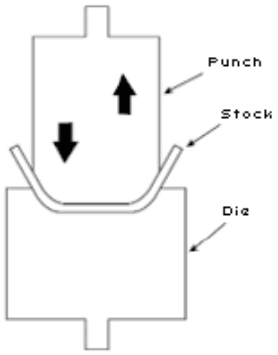


In-Running Nip Points also known as "pinch points," develop when two parts move together and at least one moves in rotary or circular motion. In-running nip points occur whenever machine parts move toward each other or when one part moves past a stationary object. Typical nip points include gears, rollers, belt drives, and pulleys.

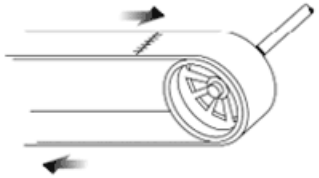


Hazardous Machine Parts, Cont'd

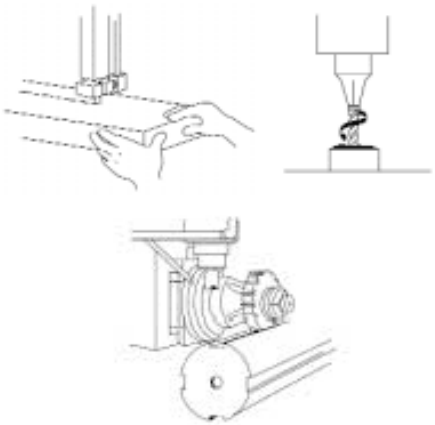
Bending Action is power applied to a slide to draw or stamp metal or other materials in a bending motion. The hazard occurs at the point of operation where the employee typically inserts, holds, or withdraws the stock by hand.



Traversing is motion in a straight, continuous line that may strike or catch an employee in a pinch or shear point created by the moving part and a fixed object.



Cutting Action is the action that cuts material and the associated machine motion may be rotating, reciprocating, or transverse.



How can you minimize machine-related injuries in the workplace?

1. Keep all tools in good condition with regular maintenance.

2. Inspect the tool for cleanliness, freely operating parts and damage.

3. Use the right tool for the job.

4. Operate according to the manufacturer's instructions.

5. Use the proper protective equipment.

6. Disconnect tools when not in use, before servicing and when changing accessories and follow lockout/tagout procedures.

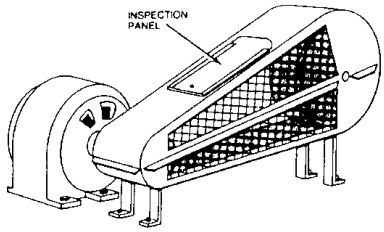
7. Keep all observers at a safe distance.

8. NEVER remove machine guarding.

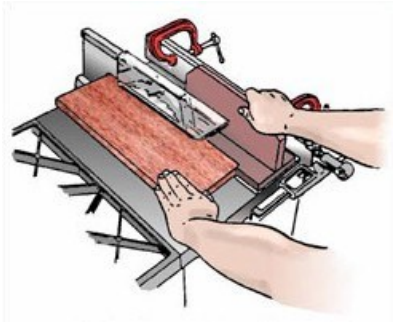
Guards & Devices

To protect ourselves and others from the dangerous motions or actions it is important to understand the types of safety devices and guards that can be used to protect us

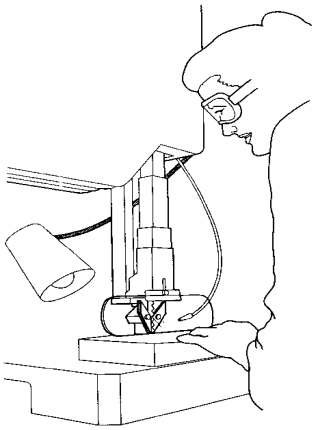
Fixed Guards provide a barrier that does not allow for employees to reach into the danger area. If these types of guards are removable, only authorized employees should remove them. Do not run machinery missing fixed guards.



Self Adjusting Guards Barrier that moves according to the size of the stock entering point of operation. Guard is in place when machine is at rest and pushes away when stock enters the point of operation.



Adjustable Guards are barriers that adjust for a variety of production operations. These adjustments are made by the operator depending on the size of the materials the operator is working with. If these guards are adjusted properly they will protect you, if not adjusted properly they will not!



Interlocking Guards work in the same way as Fixed Guards but are often used to guard parts that may need to be accessible during tool changes or jams. When the guard is removed the machinery shuts down and cannot restart until the guard is replaced.

Safe guarding by distance is a simple and effective way of protecting people from hazardous movements by designing equipment so that dangerous movements are located where employees couldn't possibly reach. The limitation of guarding by distance is that ladders and lifts could possibly allow an employee to contact these moving parts, Lockout/Tagout must be used if this is a possibility.

Restraint Devices are systems where the wrists are connected by cords and secured to a fixed anchor point which limit operator's hands from reaching the point of operation at anytime.

Pullback Devices use cords connected to operator ' s wrists and linked mechanically to the machine automatically withdraw the hands from the point of operation during the machine cycle. It is very important to adjust these prior to each use. A setting that works for one employee may not work for another if they are a different body size or type.

Two Handed Control/ Devices require the operator to apply continued pressure with both hands to the operation controls. This prevents possibility of hands to enter the danger area. These devices are made to protect you so do not try to disable this feature on machinery you work with.

Motion Detection Devices are connected to the machine' s control system to stop operation when the sensing field is disturbed. Such as a light beam, radio frequency, electro-magnetic, pressure sensing mat.

Safety Toolbox Quiz - Machine Guarding

Name (Print) _____ Company Name _____

Name (Sign) _____ Date _____ Department _____

1. Fixed guards provide a fixed barrier that prevents employees from reaching into a danger area. If these guards are removable, machines should not be operated without these fixed guards in place.

    a. True
    b. False

2. Interlocking guards are used with fixed guards. They are often used with parts that may need to be frequently replaced for tool changes or jams. They will prevent a machine from operating when the fixed guard is removed.

    a. True
    b. False

3. Adjustable guards do not need to be adjusted once they are in place to protect the operator.

    a. True
    b. False

4. Two handed control devices can only be operated with 2 hands applying pressure on the operation controls. You can safely operate a machine if you defeat these guards.

    a. True
    b. False

5. Which of these hazards caused by a machine can potentially hurt an employee and should be guarded:

    a. Rotating machinery
    b. Punching actions
    c. Shearing actions
    d. In running nip points
    e. All of the above