

## MACHINE GUARDING SAFETY

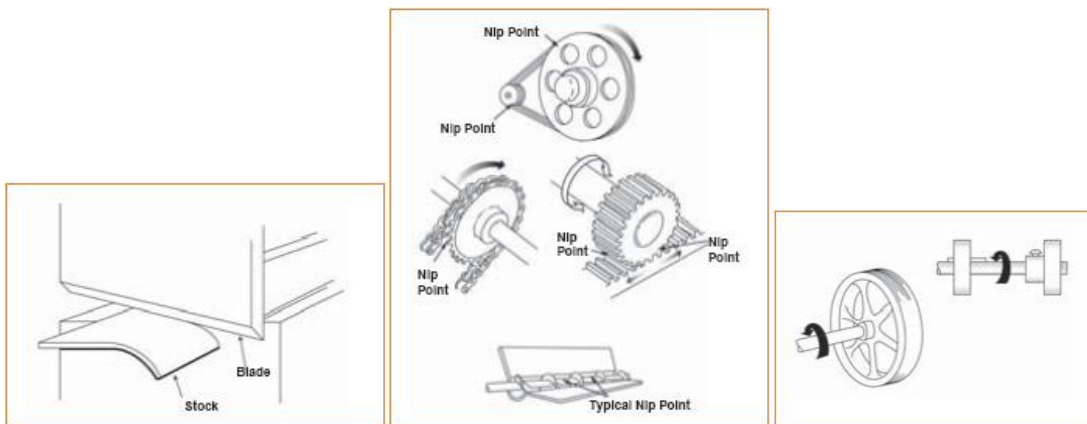


### GENERAL

Anyone working around stationary equipment should be able to identify potential amputation hazards. Understanding the mechanical components of machinery, the mechanical motion that occurs at or near these components and specific worker activities performed in conjunction with machinery operation will help workers avoid injury.

Three types of mechanical components present amputation hazards:

- Point of Operation-Mechanical actions that occur at the point of operation, including cutting, shaping, boring, and forming. Creates caught between hazards where fingers, hands, body may be crushed or amputated
- Power-Transmission Apparatuses are mechanical systems that transmit energy such as flywheels, pulleys, belts, chains, couplings, connecting rods, spindles, cams, and gears. Parts of the body may be caught between or drawn into the nip point and crushed, mangled, or severed
- Other Moving Parts are the parts that move while the machine is operating, such as reciprocating, rotating, and transverse moving parts as well as lead mechanisms and auxiliary parts of the machine. Creates hazards where a worker's clothing or hair may be pulled into machinery.



Activities that present potential amputation hazards:

- Machine set-up/threading/preparation,
- Normal operation,
- Clearing jams,
- Machine adjustments,
- Cleaning of machine,
- Lubricating of machine parts, and
- Scheduled and unscheduled maintenance.

## GUARDS AND DEVICES

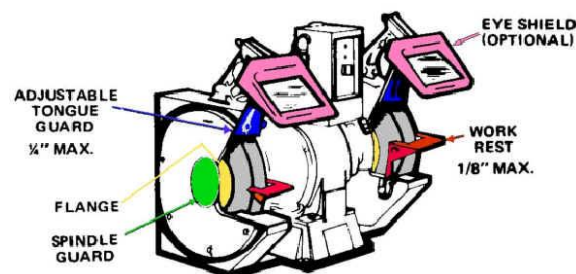
Guards and Devices help protect against accidental contact with moving machinery.

### Types of Guards:

1. *Fixed-Barrier* that allows for stock feeding but does not permit operator to reach the danger area.
2. *Adjustable-Barrier* that adjusts for a variety of production operations.
3. *Interlocking*- Will shut off or disengage power and prevent machine start-up when guard is open. Should allow for inching of machine. Replacing the guard should not automatically restart the machine.



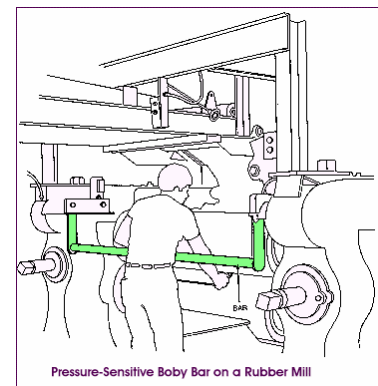
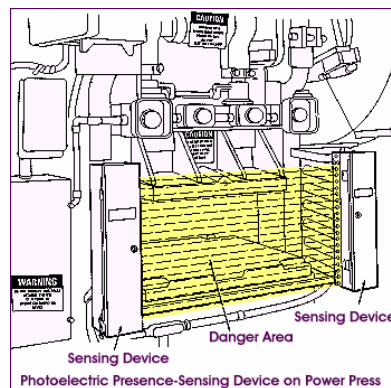
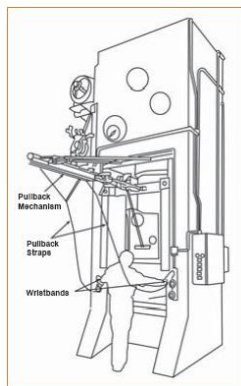
One of the more common violations of the machine guarding standard deals with pedestal grinders. Ensure that all grinders are properly guarded.



- Abrasive wheels used on bench and pedestal grinders must be equipped with safety guards. The safety guard encloses most of the wheel — covering the flange, spindle end, and nut projection — while allowing maximum exposure of the wheel periphery. The exposed surface of the wheel should not exceed 90 degrees or one-fourth of the periphery.
- Because the safety guard is designed to restrain the pieces of a shattered grinding wheel, the distance between the safety guard and the opening at the top of the wheel must not be more than 1/4-inch. If the distance is greater than 1/4-inch, then an adjustable “tongue guard” must be installed to protect workers from flying fragments if the wheel shatters. The tongue guard must be adjusted to maintain a maximum 1/4-inch distance between it and the wheel.
- An adjustable work rest must also be installed and adjusted to maintain a maximum clearance of 1/8-inch between it and the wheel. This prevents the operator’s hands or the work from being jammed between the wheel and the rest.

### Types of Devices:

1. Pullback Devices-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.
2. Presence-Sensing Devices-Interlock into the machine's control system to stop operation when the sensing field (photoelectric, radio frequency, or electromagnetic) is disturbed. Uses optical, capacitance and other means to detect human presence to stop machines.
3. Safety Trip Controls (pressure-sensitive body bar, safety tripod, safety tripwire) - Stops machine when tripped. A Stop Bar that is activated should the user get pulled into the machine.



Pay attention to signs like these:



**IMPORTANT! Guards must be in place. If a guard is removed to perform maintenance or repairs, follow lockout/tag out procedures.**

Replace the guard after repairs are completed. Do not disable or move machine guards for any reason. If you notice that a guard is missing or damaged, contact your supervisor and have the guard replaced or repaired before beginning work.