HEALTH, SAFETY & ENVIRONMENTAL MANUAL	14.8 Machine Guarding			
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MACHINE GUARDING

PURPOSE

Moving machine parts have the potential to cause severe injuries such as crushed fingers or hands, amputations, burns, or blindness. Machine guarding measures are essential to protect workers from coming into contact with hazards.

SCOPE

Injuries

Every year, thousands of workers are injured because of machine-related incidents. This alarming statistic accounts for many lost time injuries in Ontario. Ministry of Labour orders written under the Industrial Regulation are often related to inadequate guarding and lockout.

There are many types of potentially hazardous energy at any time including electrical, thermal, chemical, pneumatic, hydraulic, mechanical, and gravitational. These forms of energy must be locked out, blocked, or released to ensure that machinery or equipment does not turn on or move during installation, repair or maintenance.

Rotational motion hazards:
Pulley, drill, circular saw, rollers, grinding wheel, lathe, shaft, router, milling, boring machine, gear and chain, nip points.

Reciprocating motion hazards:
Press, jig saw, drill press, cutters, shears, punch action of press

Transverse motion hazards:
Conveyor belt, band saw, belt sander, lift truck

Motion	Action	Type of Injury
Rotating	Cutting/Trapping	Laceration/Amputation/Suffocation
Back and Forth, Up/Down	Impact/Struck by/Crushing	Fracture/Amputation/Death
Straight Line	Entanglement/Pulled by	Sprain/Fracture/Amputation/Death

Industrial Regulation Legislation

The Regulations have the following specific provisions:

- Preventing Access to Exposed Part: guards must protect person from moving part. (s.24)
- In-running Nip Hazard: guards must protect person from access to pinch points. (s.25)
- Waste Stock and Protection: guards must protect person from processed materials, production, or waste stock not just the moving machinery/equipment parts. (s.26)
- Emergency Stop on Machine: must be easy to see and reach. (s.27)

MACHINE GUARDING

- Operating Control for Machine: control that acts as a guard must be in safe zone for operator, cannot be operated accidentally, and must not be made ineffective, e.g., tied down. (s.28)
- Start Up Warning Devices: all parts of conveyor or other machinery not visible from control area must give a warning before it starts passing over workers (s.33)
- Conveyors: provision of guards. (s.34)
- Lockout: lockout requirements (s.42, 42.1)
- Stopping and Blocking Machine: the machine must be motionless and moving parts blocked before any cleaning, oiling, adjusting, repairing or maintaining work is done on any part of the machine. (s.75)
- Starting a Machine: controls and other control mechanisms must be locked out as well as other precautions (e.g., blanking off, energy release) where starting the machine or equipment may endanger the worker. (s.76)

Where are the safety hazards?

To complete a safety hazard review, start by checking all machinery to see whether there are moving parts that could come into contact with the operator:

1. Check manufacturer's information for guidance on appropriate machine guarding
2. Ensure that guards are not removed. Check:
   a. At the controls: starting or stopping, set-up, adjusting
   b. Where you feed materials into the machine: loading, cleaning
   c. Where the machine cuts, turns, drills, punches, or moves in any way
   d. At the gears, wheels, cylinders, belts, rollers, chains, cables, sprockets, cams
   e. Around any machinery and equipment that can release energy (e.g., hydraulic systems).

Types of Machines at the J-AAR maintenance shop:

Lathe
Hydraulic press
Chop saw
Band saw
Drill press
Pedestal grinder
Iron worker

Controls

There are several means for controlling machine hazards:

- Safety Guards and Devices (engineering)
- Safety Procedures and Practices (administrative)
- Personal Protective Equipment

MACHINE GUARDING

Safety Guards and Devices

Guards and safety devices can help protect you from dangerous contact. Guards, barriers, and safety devices must prevent your fingers, arms – or your whole body – from getting into a danger zone.

- Guards must be designed and placed correctly: right size opening and distance to person
- Guards must work well and fit the machine properly

Safety Procedures and Practices

These include proper lockout/tagout/tryout procedures before service, maintenance, or repair jobs on machines. Standard operating procedures to check, set up machines, start and finish the job are also included.

Personal Protective Equipment

Use the right protective equipment and clothing for the job. Practice proper hygiene practices. Do not use damaged or dirty PPE or PPE that fits poorly.

Inspection and Maintenance

Conduct an inspection of the machinery and guards prior to each use and also inspect the entire workplace at least monthly. Include:

- Broken or missing guards and devices
- Loose parts, unusual noise, leaks, or vibration
- Unfamiliar odours, heat, smoke, dust, fumes, vapours
- Messy work area and floor, housekeeping
- Inadequate lighting

Do not operate, service, maintain, or repair a machine unless trained and authorized to do so.