



ABOUT MACHINE GUARDING AND SAFETY DEVICES

LENGTH: 13 MINUTES

PROGRAM SYNOPSIS:

Our workplace is full of hazards, hazards that can hurt us, or kill us. Controlling these hazards and preventing injuries is the point of our safety and health program. One such hazard is the one presented by pinch points, nip points, moving parts and the point of operation of equipment and machinery. Avoiding contact with these types of powerful hazards can prevent injuries and save lives. That is the point of our facility's machine guarding program and that is the point of this program. So, pay close attention as we get to the point about machine guarding and safety devices.

Topics include a machine's point of operation and other hazards, safe operating procedures, personal protective equipment, good housekeeping, the use of machine guards, electrical interlocks, pressure-sensing devices and two-hand devices.

PROGRAM OBJECTIVES:

After watching the program, the participant will be able to explain the following:

- What a machine's point of operation is as well as other machine hazards;
- Which basic safe operating procedures to follow when using a machine;
- What personal protective equipment and good housekeeping practices are required around machinery;
- How guards and electrical devices protect operators and the importance of never defeating them;
- How pressure-sensing and two-hand devices prevent body parts from entering a machine's danger zone.

PROGRAM OUTLINE

MACHINE OPERATOR REQUIREMENTS

- In order to protect workers from machine hazards, our organization has developed a machine guarding program. This program utilizes a combination of fixed guarding, light curtains, interlock switches and other safety devices to prevent inadvertent contact with a machine's hazards.
- Typically, it's a machine's operator who is in the closest proximity to its hazards. As a machine operator, you must make it a point to know and understand the hazards presented by any machine or equipment you are assigned to operate.
- You must also be trained and authorized by our organization before using any tool, equipment or machine.
- Prior to using any tool, machine or equipment, the operator must perform a pre-operational inspection. This inspection must include making sure that safety guarding is in place and in good condition before using the equipment.
- Do not use any tool, machine or equipment with damaged or missing guarding.

THE POINT OF OPERATION & OTHER HAZARDS

- The point of operation is the location where the action of the machine performs work, such as cutting, bending, drilling or punching. These powerful operations are designed to quickly cut, bend, drill or punch wood, metal and other sturdy materials.
- Anytime a finger, hand or arm comes into contact with these operations a traumatic and disabling injury is likely to occur.
- In addition, the action of a machine often creates byproducts that can endanger the safety of the operator or nearby co-workers. Airborne debris, falling objects, sparks and harmful light are also hazards that must be guarded against and controlled.
- In addition to the point of operation and the action of the machine itself, there are often other hazards related to a machine or process.
- For example, conveyors, belts, gears and other mechanisms help feed or remove material from the area of a machine or process. These types of moving parts create pinch points, nip points and sharp edges which can also cause serious injury.
- When any of these types of hazards cannot be controlled or eliminated by the design of the machine or equipment, then some type of machine guarding or safety device must be used to protect workers from the hazard.

SAFE OPERATING PROCEDURES

- You must make it a point to understand that not all hazards can be fully guarded and your safety also depends on the proper use of protective equipment and the following of safe operating procedures while working with or in the area of tools, equipment and machinery.
- If you are a machine operator, you must devote your undivided attention to the task at hand.
- You must always be alert to the actions of your machine and the placement of your hands and body relative to the hazards around you. The point here is to avoid placing any body part near a machine's point of operation, an in-running nip point or material feed.
- Use push sticks, assist devices or other approved tools to feed stock or retrieve parts from a machine. Do not reach into a machine with your hand for any reason.
- Complacency, rushing, distractions and other causes of inattention are often cited as the cause of serious injuries to machine and equipment operators.

- Be aware that long hair, loose clothing and jewelry should never be worn when working with or around any type of moving machinery. Any of these items can become entangled in moving parts, pulling you into the machine or severing your fingers or hand.
- Wearing gloves around moving machinery can also create an entanglement hazard. If you must handle sharp material while also operating a tool or machine, check with your supervisor to devise the safest way to perform the task.

PERSONAL PROTECTIVE EQUIPMENT

- Safe work practices will also require wearing the appropriate proper personal protective equipment for the hazards in your work area.
- Typically, steel-toed boots and safety glasses with side shields are required as the minimum level of protection for machine and equipment operators.
- Hearing protection, hard hats and face shields may also be required in some instances.
- Make it a point to understand what PPE is required in your work area and wear it every time. This equipment is your last line of defense against injury.

GOOD HOUSEKEEPING

- An important part of staying safe around moving parts and machines is practicing good housekeeping.
- Whether you are a machine operator, maintenance worker or perform some other job in an area around moving equipment, good housekeeping is one of your biggest job responsibilities.
- Keeping the work area free of clutter can prevent slips, trips and falls, which can be disastrous around running machinery.
- Also, regularly removing debris and excess materials from near the point of operation reduces the risk of flying particles and projectiles.

MACHINE GUARDS

- Fixed guards are stationary devices that are used to protect workers from hazardous areas of a machine that rarely need to be accessed by the operator.
- Fixed guards should not be easy to remove and must be designed so that a worker's body parts either cannot pass through the openings or if they can pass through will not be able to get close enough to the hazard to make contact.
- If you notice that a fixed guard has been damaged or has been removed, do not operate the machinery. Report the situation to someone who can have the guarding repaired.
- Some smaller tools such as grinders and saws have guarding or shielding to prevent contact with the blade of the tool or with flying debris. Never remove this type of guarding and never operate a tool that has had this guarding removed.
- Keep in mind that machine guarding is often the last barrier between you and hazardous moving machine parts. Never remove, defeat or bypass any type of machine guarding. If you feel that a guard is preventing you from working properly, stop work and consult your supervisor.

ELECTRICAL INTERLOCKS

- Another means of protecting workers from the danger of moving machine parts is through the use of electrical interlocks. These safety devices prevent a machine from operating whenever a guard or cover is out of place.
- The switches or sensors of an electrical interlock allow an electric control circuit to be completed only when a machine's guarding is in its proper position. If the control circuit is interrupted, such as when a guard is not place, the machine will shut down.
- Electric interlocks are in place for your protection. Never remove, defeat or disable these important safety devices.

PRESENCE-SENSING DEVICES

- Certain types of safety devices can detect the presence of a worker and can be configured to either allow a machine to run or shut it down depending on the situation. Light curtains, pressure sensitive trips and pressure sensitive mats are some examples of these types of presence-sensing devices.
- A pressure-sensitive mat can be configured to shut down a machine when activated by the presence or absence of a certain amount of pressure.
- For example, an operator may be required to stand in a predetermined safe location while a machine is in operation. If the operator's presence isn't detected, the machine will not operate.
- Pressure sensitive-trips are another type of safety device that are activated by the presence or absence of a predetermined amount of pressure.
- A commonly used pressure sensitive trip is a cable attached to an electrical interlock switch. If a worker pulls on or leans against the cable with enough force, the switch will be activated and the equipment will be shut down. This type of safety device is commonly used on various types of conveyor systems.
- One of the most commonly used types of presence sensing safety devices are light curtains.
- Light curtains use various types of light beams directed into photoelectric sensors to detect the presence of an object, such as a hand. A switch is tripped when a hand or other object interferes with one of these light beams and the machine is shut down.
- Light curtains must only be adjusted by someone who is trained and authorized. They should be tested at the beginning of each shift by using an approved testing device to test each light beam for proper operation.
- Never place a body part near a machine's point of operation in an effort to test a light curtain.

TWO-HAND CONTROL SYSTEMS

- In some instances, there is no practical way to guard against an operator placing a hand into the operation of a machine. When this is the case, a machine is often equipped with a control system that requires two hands to operate. This ensures that no free hand is available to enter into the action of a machine.
- Often called a "two-hand control" or "two-hand trip", these control systems require the concurrent use of both hands to allow the operation of a machine and also the complete release of both controls before the machine is allowed to reset and be available to cycle again.
- If your machine is equipped with two-hand control or two-hand trip, make sure you understand its proper function. If you suspect the control is not working properly, notify the proper authority as soon as possible so this important safety system can be properly repaired.

TO THE POINT ABOUT MACHINE GUARDING AND SAFETY DEVICES

Review Quiz

Name _____ Date _____

Please provide answers to the following to show how well you understand the information presented during this program.

1. You must be trained and authorized by our organization before using any tool, equipment or machine.
 - a. True
 - b. False

2. Which of the following hazards poses risks when conveyors, belts and gears are in motion?
 - a. Pinch points
 - b. Nip points
 - c. Sharp edges
 - d. All of the above

3. All hazards of a machine must be fully guarded when it is in operation.
 - a. True
 - b. False

4. Long hair, loose clothing and jewelry may be worn around moving machinery as long as they are kept away from the point of operation.
 - a. True
 - b. False

5. No matter what type of job you perform in an area containing moving equipment, good housekeeping is one of your biggest job responsibilities.
 - a. True
 - b. False

6. What should you do if you feel a machine guard is preventing you from performing your work properly?
 - a. Tie back or remove the guard so it doesn't interfere with your work
 - b. Continue your work and deal with the issue as best you can
 - c. Stop work and consult your supervisor

7. A pressure-sensitive mat can be configured to shut down a machine when activated by the presence or absence of a certain amount of pressure.
 - a. True
 - b. False

8. At the beginning of your shift, you should test a light curtain by placing your hand near the machine's point of operation and quickly removing it.
 - a. True
 - b. False

9. Two-hand control systems require the concurrent use of both hands.
 - a. True
 - b. False

ANSWERS TO THE REVIEW QUESTIONS

1. a

2. d

3. b

4. b

5. a

6. c

7. a

8. b

9. a