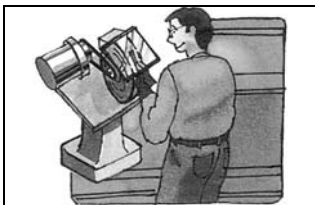


KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding—An Overview

Overview Of Topic

Machine operators who understand a machine's hazards and how to control them will have a reduced risk of injury. Proper operation of the machine, including the machine guards, can improve productivity as well as safety.

There are five general techniques for safeguarding machine operation, but all guards must be able to prevent contact, must be secured in place or be otherwise tamper-proof, must create no new hazards, should allow for lubrication with the guard still in place, and must not interfere with the machine operation.

Types of safeguarding

Several of the types of safeguarding would include:

- Guards — these can be fixed, interlocking, adjustable, or self-adjusting. They are a physical barrier to contact.
- Devices — these can be presence sensing, pullback, restraint, operational controls, or gates. They limit or prevent access to the hazardous area.
- Location or distance — hazards are reduced by locating the machine so that its hazardous areas are not normally accessible.
- Automated feeding and ejection methods — these eliminate some of the operator's exposure to the hazards.
- Miscellaneous aids — shields, feeding-tools, holding devices, or awareness barriers also protect operators and people in the area.

The best machine operator knows what the machine does, how the operating controls affect the work, and when maintenance and repairs are needed. Operators who understand machine-specific operating instructions contribute to having a more efficient operation.

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

Instructions can also lead to less risk of injury because the instructions explain the machine's operations and how to prevent, or at least recognize, a malfunction. A lack of knowledge and not noticing hazards often leads to injury.

Report a machine that is missing the guard, or has an inoperative guard. It is unsafe to operate the machine until the guard is replaced or repaired. A missing or inoperative guard cannot provide adequate protection.

If a guard becomes damaged while the machine is in operation, the machine should be shut down and inspected. The guard may need to be replaced or repaired before work can safely proceed.

If unexpected start-up could cause injury, use a lockout/tagout program. Any major repairs or tool changes that would expose workers to the machine's hazards require lockout/tagout.

Employee Training

Although OSHA does not specify training requirements under the machine guarding regulations, the General Duty Clause requires that employers provide a safe work environment. Employees who are knowledgeable about machine hazards are safer workers.

Training Tips

Review 29 CFR 1910 Subpart O—Machinery and machine guarding. Using the employee handout, review the purpose of machine guards.

Describe the types of guards in place at your facility, in a particular department, or on a specific piece of equipment.

Discuss any injuries or close calls that your machine operators or mechanics may have had. Ask the trainees to think of ways to prevent the accident or "near miss" from being repeated.

Explain who in the facility should be contacted with reports of missing or damaged guards.

Refer to the company lockout/tagout program, and when it is required to be used.

Where To Go For More Information

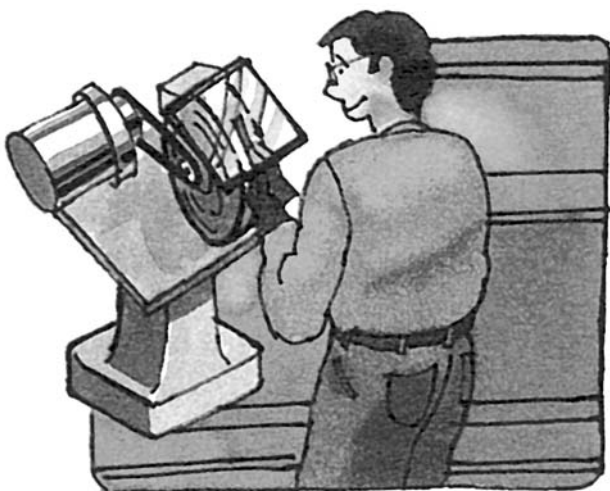
29 CFR 1910 Subpart O—Machinery and machine guarding.

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

Machine Guarding—An Overview

Overview

Machine guards are your first line of defense against injuries caused by machine operation. Each machine must have adequate safeguards to protect operators from the machine's hazards.



Having an understanding of how a machine works, and how the guards can protect you, will result in a reduced risk of injury.

All guards must:

- prevent contact;
- be secured in place or otherwise be tamper proof;
- create no new hazard;
- allow for lubrication with the guard still in place;
- not interfere with the machine operation.

Types of safeguarding

Several types of safeguarding include:

- guards — fixed, interlocking, adjustable, or self-adjusting.
- devices — sensing, pullback, restraint, operational controls, or gates.
- location or distance — locating the machine so that hazardous areas are not normally accessible.
- automated feeding and ejection methods — eliminate operator exposure to the hazards.
- miscellaneous aids — shields, feeding-tools, holding devices, or awareness barriers.

What must I do?

You should always report missing, damaged, or inoperative guards. It is not safe to operate machinery without properly working guards.

If the guard is damaged or becomes inoperative while you are working, shut the machine down, and have the guard inspected by a qualified person. The guard may need to be repaired or replaced before work can safely proceed.

If unexpected machine start-up could cause injury, use the lockout/tagout program.

MACHINE GUARDING—AN OVERVIEW HANDOUT

Handouts may be copied and distributed to workers for use during your training session. Please refer to HOW TO USE THIS MANUAL for restrictions.

Copyright J. J. Keller & Associates, Inc.,
www.jjkeller.com

Original content is the copyrighted property of J. J. Keller & Associates, Inc.®

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding—An Overview Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Machine Guarding—An Overview. The session covered:

- the need for machine guarding.
- the types of safeguarding.
- how to report damaged or missing guards.

The space below is for employees to “sign off” that they were in attendance.

Date of Training: _____

Facility: _____

Employee Signature

Print Name Here

Supervisor's Signature

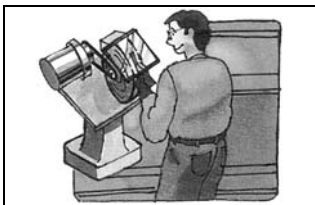
MACHINE GUARDING—AN OVERVIEW SIGN-OFF

Sign-off sheets may be copied and distributed to workers for use during your training session. Please refer to HOW TO USE THIS MANUAL for restrictions.

Copyright J. J. Keller & Associates, Inc.,
www.jjkeller.com

Original content is the copyrighted property of J. J. Keller & Associates, Inc.®

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding—Mechanical Hazards

Overview Of Topic

Each piece of machinery has its own unique mechanical and non-mechanical hazards. Machines can cause severe injuries: amputations, fractures, lacerations, or crushing injuries. Machines can also cause minor injuries such as bruises, abrasions, sprains or strains, burns, or cuts.

Mechanical hazards

Examples of mechanical hazards that can hit, grab, or trap an operator are:

- Hazardous motions — including rotating machine parts, reciprocating motions (sliding parts or up/down motions), and transverse motions (materials moving in a continuous line).
- Points of operation — the areas where the machine cuts, shapes, bores, or forms the stock being fed through it.
- Pinch points and shear points — areas where a part of the body can be caught between a moving part and a stationary object.

A wide variety of mechanical motions and actions may present hazards to the worker. The basic types of hazardous mechanical motions and actions are:

- Hazardous Motions
 - rotating
 - reciprocating
 - traversing
- Hazardous Actions
 - cutting
 - punching
 - shearing
 - bending

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

Employee Training

Examples of non-mechanical hazards that can injure operators, or other people in the area, include chips, splashes, sparks, or sprays that are created as the machine is running.

Machine entrapment injuries can be severe. Follow your company's procedures for calling emergency medical personnel and for reporting the injury to management.

Machine operation instructions can also lead to less risk of injury because the instructions explain the machine's operations and how to prevent, or at least recognize, a malfunction.

Employees who follow the machine's operating instructions ensure that the machine is being run correctly and safely. This includes all machine safety features and guards.

Although OSHA does not specify training requirements under the machine guarding regulations, the General Duty Clause requires that employers provide a safe work environment. Employees who understand mechanical hazards can protect themselves from those hazards.

Training Tips

Select which handout you will use and review it prior to training.

Review 29 CFR 1910 Subpart O—Machinery and machine guarding. Using the employee handout, review the types of mechanical hazards.

Describe the types of guards in place at your facility, in a particular department, or on a specific piece of equipment.

Discuss any injuries or close calls that your machine operators or mechanics may have had.

Explain the importance of doing a machine inspection to check for properly working safety devices prior to starting the machine, or when changing shifts.

Where To Go For More Information

29 CFR 1910 Subpart O—Machinery and machine guarding.

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

Machine Guarding—Mechanical Hazards

Overview

Each piece of machinery has its own unique mechanical and non-mechanical hazards. Machines can cause severe injuries: amputations, fractures, lacerations, or crushing injuries. Machines can also cause minor injuries such as bruises, abrasions, sprains or strains, burns, or cuts.

Mechanical hazards



Examples of mechanical hazards that can hit, grab, or trap an operator are:

- Hazardous motions.
- Points of operation.
- Pinch points and shear points.

There are different types of hazardous mechanical motions and actions:

- Hazardous motions such as rotating parts, reciprocating parts, or traversing parts.
- Hazardous actions such as cutting, punching, shearing, or bending.

Non-mechanical hazards

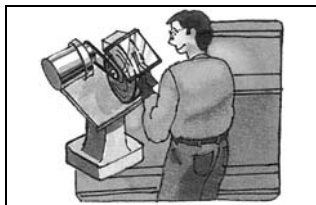
There are also non-mechanical hazards that can injure operators, including flying chips, splashes, sparks, or sprays that are created when the machine is running.

Operating instructions

Follow the machine's operating instructions to ensure that the machine is being run correctly and safely. Understand how the machine works, and you will reduce your risk of injury.

MACHINE GUARDING—MECHANICAL HAZARDS HANDOUT#1

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding—Mechanical Hazards Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Machine Guarding—Mechanical Hazards. The session covered:

- Types of mechanical hazards.
- Mechanical motions and actions which present hazards.
- The need to ensure that machine guards are operating.
- How proper machine operation ensures worker safety.

The space below is for employees to “sign off” that they were in attendance.

Date of Training: _____

Facility: _____

Employee Signature

Print Name Here

Supervisor's Signature

MACHINE GUARDING—MECHANICAL HAZARDS SIGN-OFF#1

Sign-off sheets may be copied and distributed to workers for use during your training session. Please refer to HOW TO USE THIS MANUAL for restrictions.

4/02

Copyright J. J. Keller & Associates, Inc.,
www.jjkeller.com

Original content is the copyrighted property of J. J. Keller & Associates, Inc.®

J. J. KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

Machine Guarding Keeps You Safe

Machine guards are your first line of defense against injuries caused by machine operation. Each machine must have adequate safeguards to protect operators from the machine's hazards.

Methods of Safeguarding

There are five general types of safeguards that can be used to protect workers:

- **Guards**—These are physical barriers that prevent contact. They can be fixed, interlocked, adjustable, or self-adjusting.
- **Devices**—These limit or prevent access to the hazardous area. These devices can be: presence-sensing devices, pullback or restraint straps, safety trip controls, two-hand controls, or gates.
- **Automated feeding and ejection mechanisms**—These eliminate the operator's exposure to the point of operation while handling stock.
- **Machine location, or distance**—This method removes the hazard from the operator's work area.
- **Miscellaneous aids**—These methods can be used to protect both operators and people in the area. Examples include shields to contain chips, sparks, or sprays; holding tools that an operator uses to handle materials going into the point of operation; and awareness barriers to warn people about hazards in the area.

Missing or Damaged Guards

Report a machine that is missing a guard. It is unsafe to operate the machine until the guard is replaced. If your inspection shows a damaged guard, also report it. The damaged guard may not be providing adequate protection. If a guard becomes damaged while you are operat-

ing the machine, stop the machine and have the guard inspected. It may need to be replaced or repaired before you can continue to work safely.

Maintenance Allowed During Normal Operation

Routine adjustments or lubrication that can be done without removing or bypassing a guard may be done without taking any extra precautions.

Ask your supervisor about extra precautions that need to be taken if routine or repeated adjustments, tool changes, or other minor work requires that a guard be removed or bypassed.

Know When to Use Lockout/Tagout

If unexpected machine start-up could cause injury, use a lockout/tagout program. Any major repair or tool change that would expose workers to the machine's hazards requires lockout/tagout. For example, if a machine gets jammed, and a guard has to be removed or bypassed in order to remove the jam, the machine needs to be locked out to protect the person who is reaching into the point of operation to clear it.

Responding to Injuries and Accidents

Machine entrapment injuries can be severe. Follow your company's procedures for reporting the injury to management and for calling emergency medical personnel.

J. J. KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding Keeps You Safe Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Machine Guarding Keeps You Safe. The session covered:

- Methods of machine guarding.
- Missing or damaged guards, and how to report them.
- Maintenance during normal operations, and when to use Lockout/Tagout.
- Responding to injuries and accidents.

The space below is for employees to “sign off” that they were in attendance.

Date of Training: _____

Job Location: _____

Employee Signature

Print Name Here

Supervisor's Signature

MACHINE GUARDING—MECHANICAL HAZARDS SIGN-OFF-2

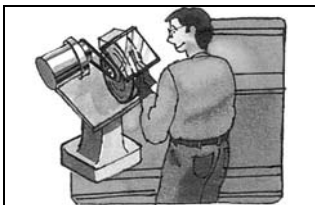
Sign-off sheets may be copied and distributed to workers for use during your training session. Please refer to HOW TO USE THIS MANUAL for restrictions.

10/09

Copyright J. J. Keller & Associates, Inc.®,
www.jjkeller.com

Original content is the copyrighted property of J. J. Keller & Associates, Inc.®

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding—Preventing Amputations

Overview Of Topic

The operation of saws, shears, slicers, slitters, and power presses can be extremely dangerous, often resulting in injuries that result in death or permanent disability.

Employees should be able to recognize and avoid amputation hazards.

Injury rates from amputation

A 1990 study from the National Institute for Occupational Safety and Health (NIOSH) reported over 800 deaths per year among machine operators and maintenance personnel.

According to the Bureau of Labor Statistics (BLS) about 10,000 occupational amputations occur every year.

Approximately one-half of all amputations occur in the manufacturing sector, while the remaining amputations are distributed among industry divisions including construction, wholesale trade, retail trade, services, etc.

Causes of amputations

The top two sources of amputations are saws and presses, however, shears and slicers are also often the cause. Slitters do not rank as high as the previously mentioned four machines.

The top five industries (with their standard industrial code) that have a high frequency of amputations are:

- Plastic Products, Not elsewhere Classified (3089).
- Sheet Metal Work (3444).
- Fabricated Structural Metal (3441).
- Motor Vehicle Parts and Accessories (3714).
- Industrial and Commercial Machinery and Equipment, Not Elsewhere Classified (3599).

KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

What are the hazards

The following types of mechanical components present amputation hazards:

- Point of operation-the area of a machine where it performs work on material.
- Power-transmission apparatuses-flywheels, pulleys, belts, chains, couplings, spindles, cams, and gears in addition to connecting rods and other machine components that transmit energy.
- Other moving parts-machine components that move during machine operation such as reciprocating, rotating, and transverse moving parts as well as auxiliary machine parts.

Safeguarding employees

Employees should be trained to recognize, identify, manage, and control amputation hazards commonly found in the workplace.

Work practices, such as lockout/tagout, employee training, and administrative controls can help prevent and control those hazards. Guarding stationary machinery can be accomplished by utilizing:

- Guards-they provide physical barriers that prevent access to hazardous areas. They should be secure and strong, and workers should not be able to bypass, remove, or tamper with them. Guards should not obstruct the operator's view.
- Devices-help prevent contact with points of operation and may replace or supplement guards. Devices can interrupt the normal cycle of the machine when the operator's hands are in the point of operation, prevent the operator from reaching into the point of operation, or withdraw the operator's hands if they approach the point of operation when the machine cycles.

Training Tips

Review the employee handout.

Explain work processes that present amputation hazards. List or demonstrate the machine safeguards that are in place.

Where To Go For More Information

29 CFR 1910—Subpart O.

29 CFR 1910—Subpart P.

J. J. KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

Machine Guarding—Preventing Amputations

Overview

The operation of saws, shears, slicers, slitters, and power presses can be extremely dangerous, often resulting in injuries that result in death or permanent disability. Employees should be able to recognize and avoid amputation hazards.

How Can It Hurt Me?

The following types of mechanical components present amputation hazards:

- Point of operation-the area of a machine where it performs work on material.
- Power-transmission apparatuses-flywheels, pulleys, belts, chains, couplings, spindles, cams, and gears in addition to connecting rods and other machine components that transmit energy.
- Other moving parts-machine components that move during machine operation such as reciprocating, rotating, and transverse moving parts as well as auxiliary machine parts.

All mechanical motion is potentially hazardous. In addition to in-running nip points, known as “pinch points,” which occur when two parts move together and at least one moves in a rotary or circular motion that gears, rollers, belt drives, and pulleys generate. The following are the most common types of hazardous mechanical motion:



- Rotating
- Reciprocating
- Transversing
- Cutting
- Pinching
- Shearing
- Bending

Guard Requirements

The purpose of machine guarding is to protect the machine operator and other employees in the work area from hazards created by ingoing nip points, rotating parts, flying chips and sparks.

Examples of this are barrier guards, light curtains, and two-hand operating devices. Machines that expose an employee to injury must be guarded. The guarding device must:

- conform with any appropriate OSHA standards.
- prevent the operator from having any part of his/her body in the danger zone during the operating cycle, if specific standards are not available.
- be attached to the machine, where possible. If the guard cannot be attached to the machine, the guard must attach elsewhere.

Special handtools used for placing and removing material from the point of operation areas must allow easy handling of the material without the operator placing a hand in the danger zone. Such tools do not replace the guards required by OSHA.

MACHINE GUARDING—PREVENTING AMPUTATIONS HANDOUT-1

J. J. KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding—Preventing Amputations Sign-off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Preventing Amputations. The session covered:

- Operations at this facility which expose to amputation hazards.
- The hazards associated with moving machine parts.
- Work practices used to prevent accidents.
- Machine guards and why they are important.
- Devices and how they work.

The space below is for employees to “sign off” that they were in attendance.

Date of Training: _____

Job Location: _____

Employee Signature

Print Name Here

Supervisor's Signature

MACHINE GUARDING—PREVENTING AMPUTATIONS SIGN-OFF-1

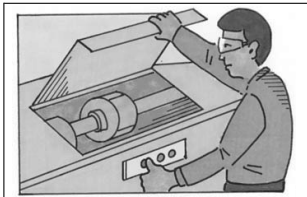
Sign-off sheets may be copied and distributed to workers for use during your training session. Please refer to HOW TO USE THIS MANUAL for restrictions.

10/08

Copyright J. J. Keller & Associates, Inc.,
www.jjkeller.com

Original content is the copyrighted property of J. J. Keller & Associates, Inc.®

J. J. KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding—Real Life Stories

Overview Of Topic

Having an understanding of how a machine works, how the guards can protect you, will result in a reduced risk of injury. All guards must

- Prevent contact;
- Be secured in place or otherwise be tamper proof;
- Create no new hazard;
- Allow for lubrication with the guard still in place; and
- Not interfere with the machine operation.

It happened like this

Xavier and Thomas were putting in a lot of overtime at the printing plant. There were some large orders waiting, and management wanted those orders to get out the door as soon as possible. As they were working one day, Thomas noticed that the guard had come off the trimmer. He pointed it out to Xavier.

“Let’s get this order done,” Xavier said. “If we report it now, they’ll shut us down. We need to finish this one up.”

Thomas wasn’t so sure.

“This isn’t safe, is it?” Thomas asked.

“We’ll just be careful,” Xavier said. “Just as soon as this order is done, you can contact maintenance, okay?”

Thomas agreed and the two continued to work. A short time later, Thomas heard Xavier cry out. He hurried over to where Thomas was standing.

“What happened?” Thomas asked Xavier.

“I cut my hand on the trimmer blade,” Xavier said. “Quick, get me some paper towels.”

“I’ll call for help,” Thomas said after he brought Xavier the paper towels.

“No, don’t call anyone,” Xavier said. “They’ll find out about the missing guard.”

“Alright, if you say so,” Thomas said.

J. J. KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

Let's talk about this, OK?

What are the issues?

- Tight production deadlines.
- Missing machine guard.
- Violation of company safety policies.
- Unreported injury.

What did Thomas do right?

- Noticed that the guard had come off the trimmer.
- Told Xavier about the missing guard.

What did Xavier and Thomas do wrong?

- Did not report the missing guard.
- Did not shut the machine down, but continued to work even with the missing guard.
- Did not report Xavier's injury.

What do you think should happen next?

- Get medical care for Xavier.
- Xavier and Thomas should be disciplined for violating company policies.
- The machine must not be used until the machine guard is fixed.
- Provide additional training on operating procedures, reporting of damaged or missing guards, work practices, and emergency procedures.

Training Tips

Missing, damaged, or inoperative guards should always be reported. It is not safe to operate machinery without properly working guards. If the guard is damaged or becomes inoperative while you are working, shut the machine down, and have the guard inspected by a qualified person. The guard may need to be repaired or replaced before work can safely proceed.

Explain who they can go to with questions or problems with machine guards.

J. J. KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS

Machine Guarding—Real Life Stories

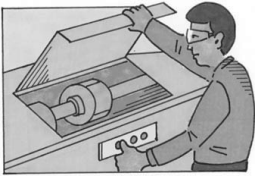
Overview

Having an understanding of how a machine works, and how the guards can protect you, will result in a reduced risk of injury. All guards must:

- Prevent contact;
- Be secured in place or otherwise be tamper proof;
- Create no new hazard;
- Allow for lubrication with the guard still in place; and
- Not interfere with the machine operation.

Let's Talk About This, OK?

What are the issues?



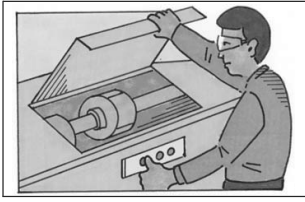
What did Thomas do right?

What did Xavier and Thomas do wrong?

What Happens Next?

What do you think should happen next?

J. J. KELLER'S 5-MINUTE WORKPLACE SAFETY TALKS



Machine Guarding—Real Life Stories Sign-off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Machine Guarding—Real Life Stories. At this training session, we covered:

- The purpose of machine guards.
- How guard protect the user.
- Who they can go to with questions about machine guards.
- Company policies on operating machines without guards in place.

The space below is for employees to “sign off” that they were in attendance.

Date of Training: _____

Job Location: _____

Employee Signature

Print Name Here

Supervisor's Signature

MACHINE GUARDING—REAL LIFE STORIES SIGN-OFF-1

Sign-off sheets may be copied and distributed to workers for use during your training session. Please refer to HOW TO USE THIS MANUAL for restrictions.

4/08

Copyright J. J. Keller & Associates, Inc.,
www.jjkeller.com

Original content is the copyrighted property of J. J. Keller & Associates, Inc.®