



# BELT CONVEYOR **GUARDING**

Proven Safety Guarding Solutions

**STAY AWAY - STAY SAFE**



## TO THE POINT WITHOUT A PINCH: THE RIGHT WAY TO GUARD

The point of this presentation is to:

- Aid in identifying the equipment in your facilities that require guarding
- Demonstrate the hazardous areas around that equipment
- Learn how to compliantly Guard that equipment with fixed guarding

# WHY DO WE NEED GUARDING?

**Any machine part, function, or process which may cause injury must be safeguarded.** When the operation of a **machine** or accidental contact with it **can** injure the operator or others in the vicinity, the hazards **must** be either controlled or eliminated.

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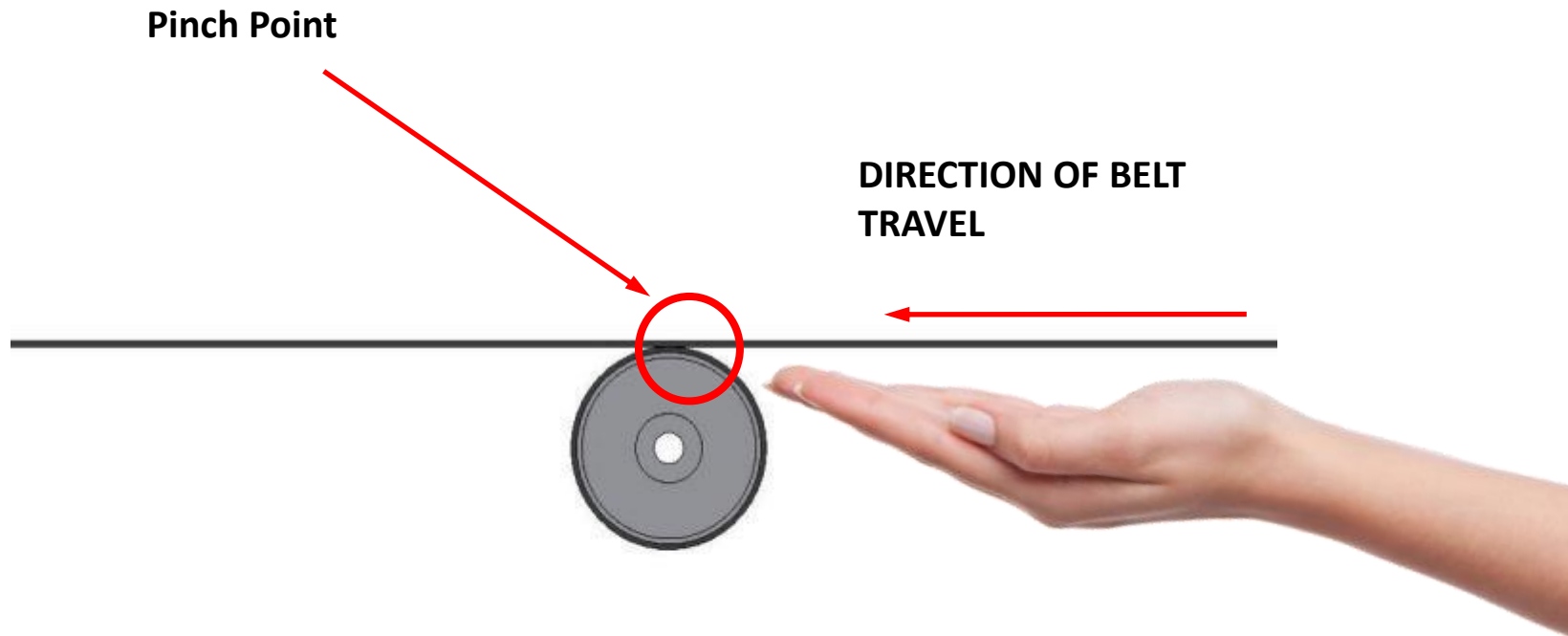
# SAFETY HAZARDS AND WHAT CREATES THEM?

1. **The Point of Operation** - the point or location where work is performed on material or where the stock or material is fed into the machine
2. **The Power Transmission Devices** – such as flywheels, pulleys, belts, connecting rods, couplings, cams, spindles, chains, cranks and gears.
3. **All Moving Parts** - all parts which move while machine is working. Including reciprocating, rotating, and transverse moving parts, feed mechanisms etc.

Please note that this presentation is focused on fixed guarding, so only the latter two mechanical hazards and how to guard them will be discussed.



# NOT JUST THE IN-RUNNING PINCH POINT



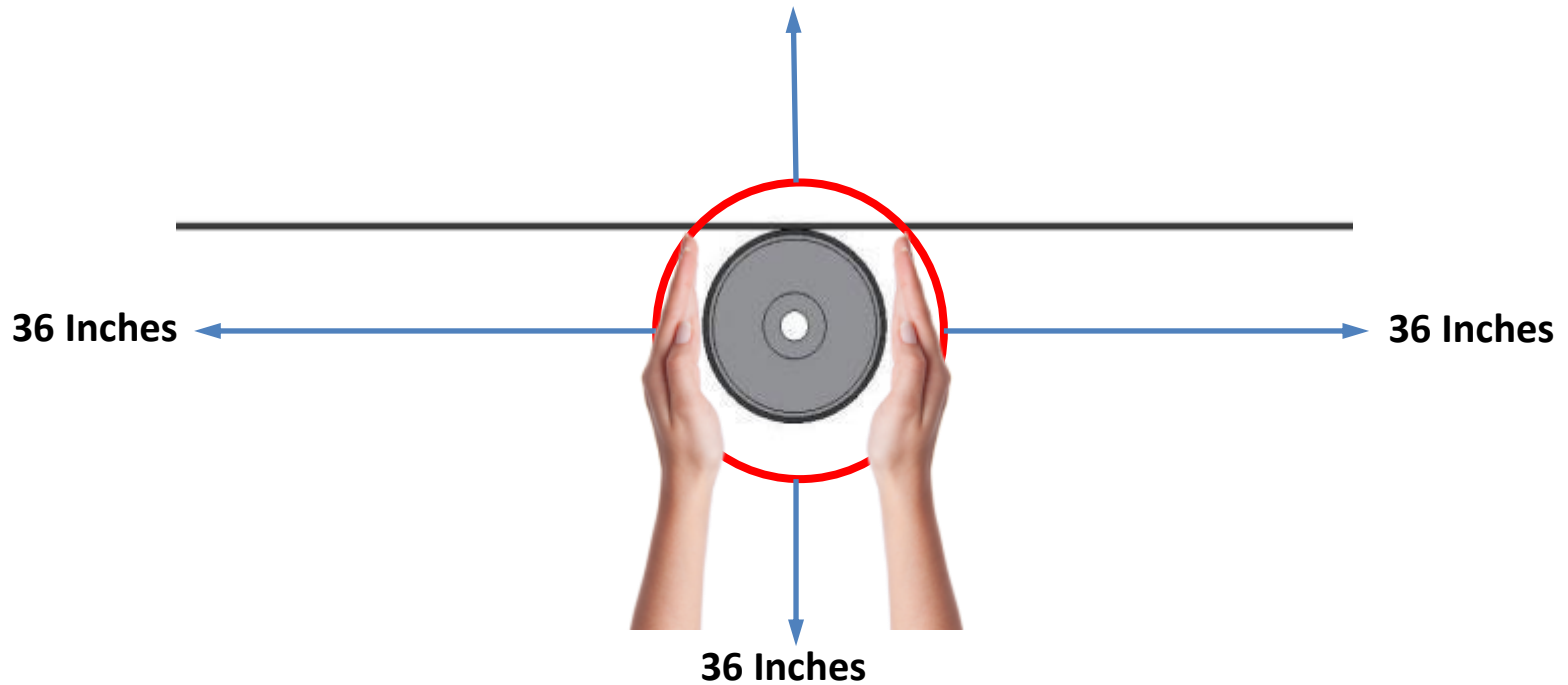
On Belt Conveyors the in-running pinch point is the area where the belt and roller make contact on the in-feed side.

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# DISTANCE FROM DANGER AREA

**DANGER ZONE**  
**KEEP 36" AWAY**

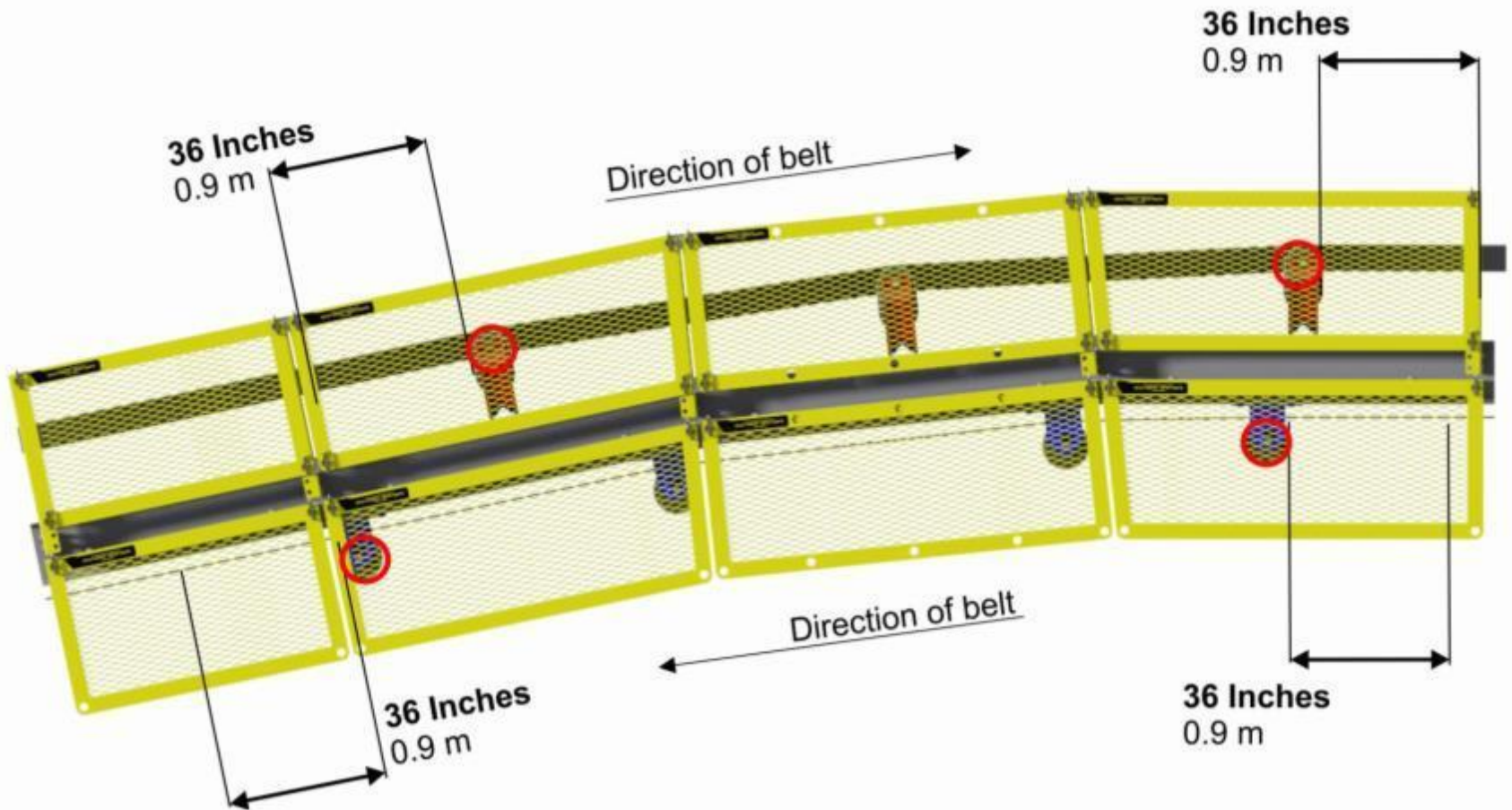


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# CONVEYOR BENDS



The conveyor bend causes pinch points at the return rollers. The guard is required to be at 36" in all directions from the pinch point and these return rollers are close together, therefore in this example the guarding is required along the complete conveyor

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# FIXED GUARDING

Fixed Guarding refers to a guard that is a physical barrier between a worker and a danger zone and it requires a “tool to remove.”



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# Principles of Fixed Guarding

There several key points that should always be considered when designing and fitting guards:

- ▼ The guard should be considered a permanent part of the machine
- ▼ The guard must make access to all moving parts and nip points physically impossible
- ▼ The guard should be installed as close to the machine part as possible while still being compliant, be secure, tamper-resistant and durable
- ▼ The guard must not impede the operation of the plant, and should be designed for the specific job and equipment
- ▼ The guard itself must not create a new hazard or manual handling risk
- ▼ The guard must ensure that no object will fall into the moving parts
- ▼ The guard can only be removed with a tool
- ▼ The guard must allow for safe lubrication and maintenance



# YOUR FIRST LINE OF DEFENCE

*A physical barrier (fixed guarding) is a means of physically preventing access to dangerous areas.*

***It is a requirement by law!***

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# COMMON AREAS REQUIRING GUARDING

## CONVEYOR HIGH RISK ZONE AREAS

- ▼ Tail pulley
- ▼ Head pulley
- ▼ Gravity take-ups and counterweights
- ▼ Snubber pulleys
- ▼ Additional drive pulleys
- ▼ V-belt or chain drives
- ▼ Transfer or load-out points
- ▼ Skirt boards
- ▼ Return idlers
- ▼ Troughing idlers that have obstructions (i.e. ladders)
- ▼ Conveyor bends
- ▼ Tripper conveyor
- ▼ Bearing/Rotating shafts
- ▼ Couplings

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# TAIL PULLEYS



Tail pulley guards should be designed to prevent any contact with:

- The pinch point between the pulley and the belt
- The exposed pulley and the pulley face
- The exposed shaft and bearing

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# COUPLINGS



- Exposed shaft & pulley
- Mesh is too large to restrict contact with rotating parts.



- Fully enclosed coupling combined with a Bearing Guard.



# V-BELTS



**V-BELT** (Belt Exposed)



**V-BELT** (Belt Guarded)

Which situation looks safer to you?

**STAY AWAY – STAY SAFE**



# PUMP GUARD



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# COUNTER WEIGHT



**Unguarded**



**Guarded**

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# IDLERS

Idlers will need to be guarded to stop someone from making contact or from it potentially falling onto someone. A pinch point guard is required if a return idler is less than 7-ft away from walking or working surfaces.



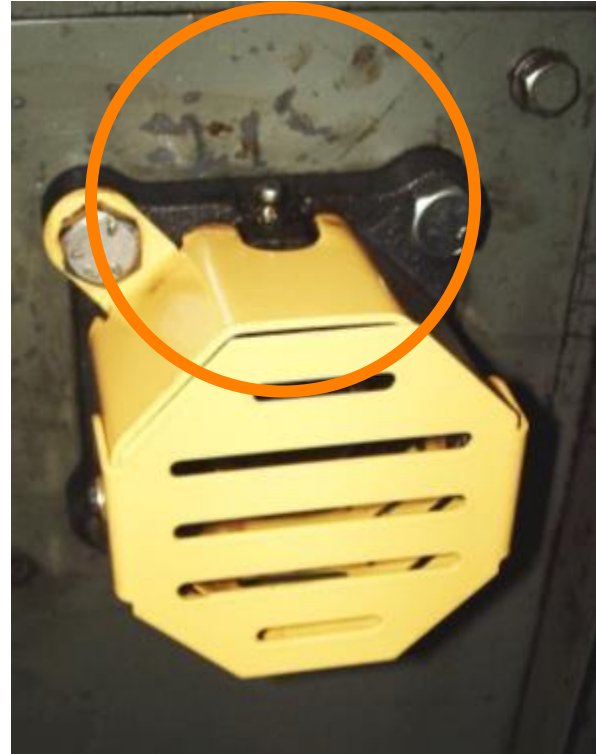
Idler baskets are required for any return rollers that are above 7-ft from the ground. Their primary duty is to catch the roller in case of failure and stop it from falling onto someone that may be walking or driving below at the time.



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# FLANGE BEARING



The photo on the left shows an unprotected flange bearing.

Although this shaft may rotate at a slow rate, if a worker were to get entangled, there's no stopping it. The photo on the right shows a properly guarded flange bearing. It is designed in such a way as to allow the greasing of the bearing without removal.

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# AUTO

The guarding should take into account the physical characteristics of the people involved and, in particular, their abilities to reach through openings and over or around barriers or guards.

**WHEN YOU ARE GUARDING EQUIPMENT YOU  
MUST NOT BE ABLE TO REACH THE HAZARD FROM**

**Around**



**Under**



**Through**



**Over**



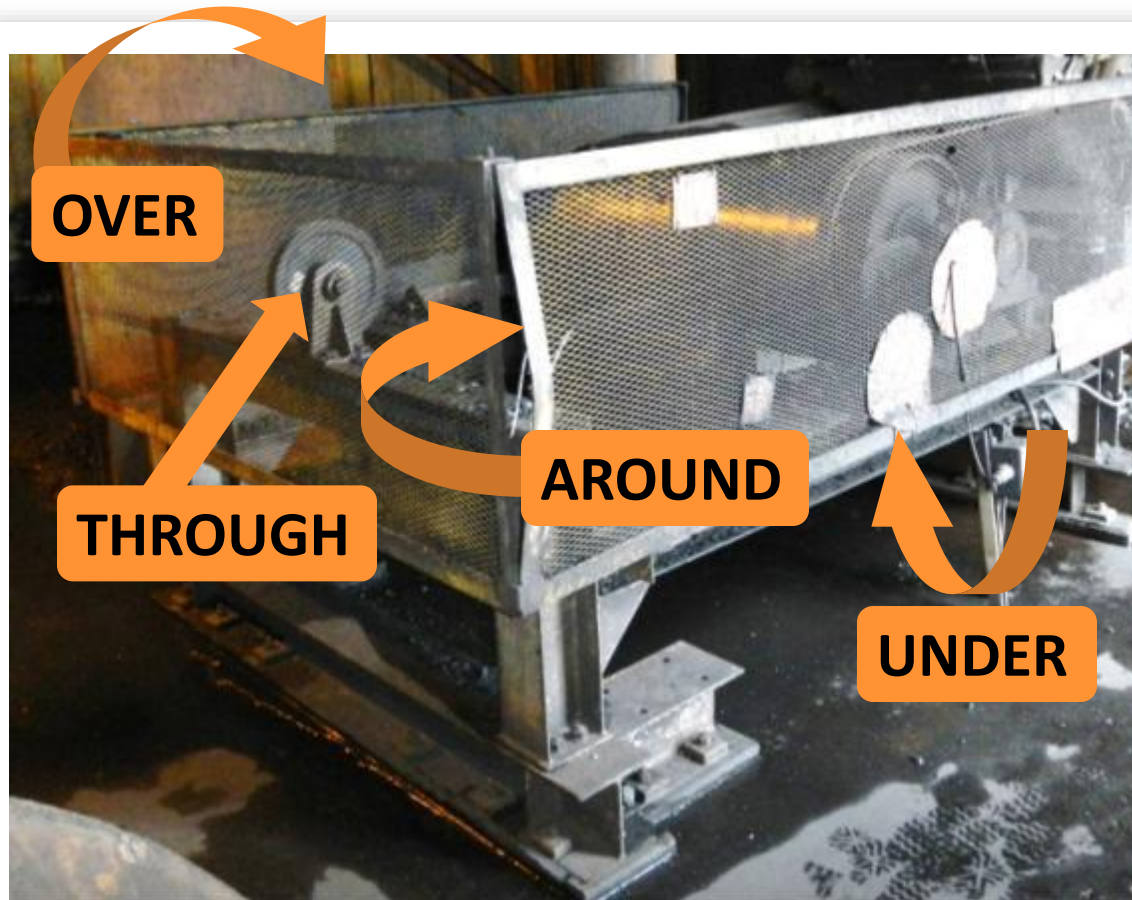
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# HAZARDS THAT ARE NOT RECOGNIZED

Here someone can reach AROUND the guard at the front corner, UNDER the guard from the bottom, THROUGH the guard at the front because the mesh is too close to what is being guarded and OVER the top.

A-U-T-O



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# HAZARDS THAT ARE NOT RECOGNIZED

Where do you see the hazards here?



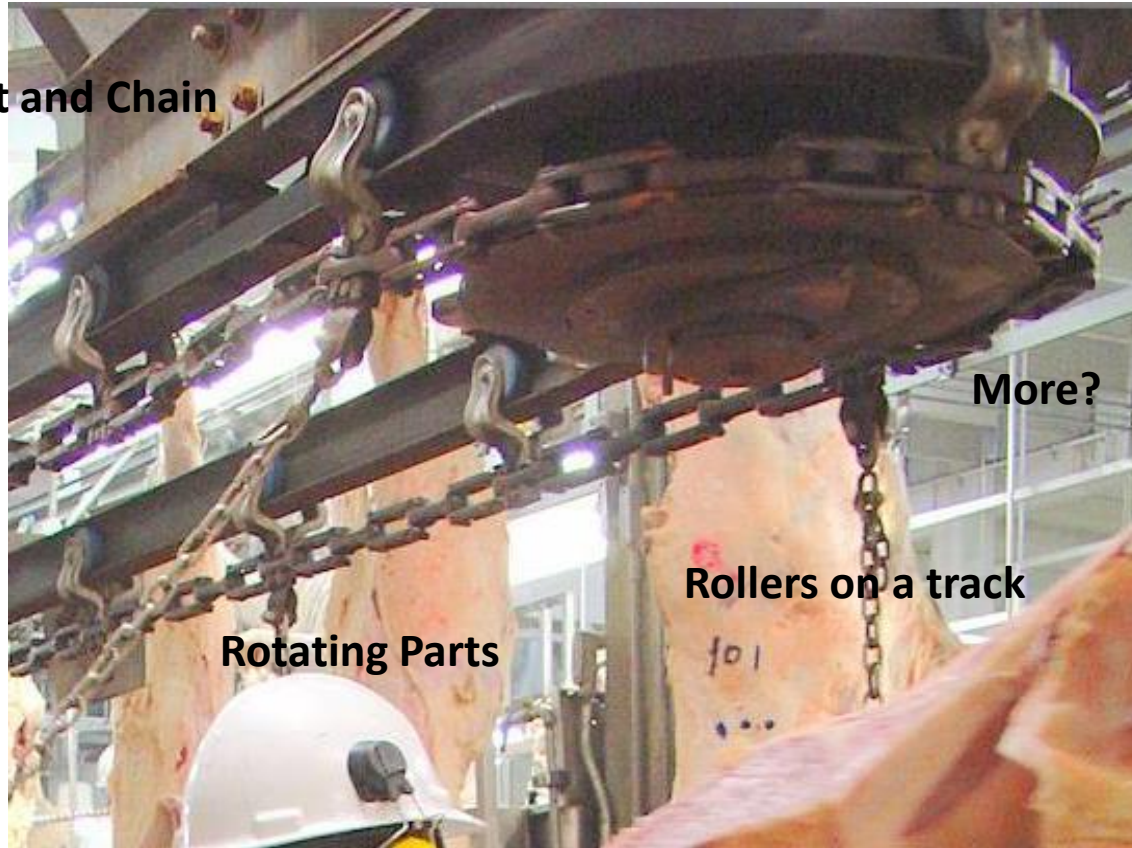
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# NOW, THIS IS A HAZARD!

What do you see as a guarding concern here?

Exposed Sprocket and Chain



More?

Rollers on a track

Rotating Parts

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# WHAT'S MISSING?



Hopefully after today you should never have to witness this.  
It definitely required a safety guard!

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# NON-COMPLIANT GUARDING VS. COMPLIANT



**COMPLIANT**

**NON-COMPLIANT**

**NON-COMPLIANT**

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# HAND RAILING VS. GUARDING



**NON-COMPLIANT**



**COMPLIANT**

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# DOES YOUR GUARD CREATE A HAZARD?



Does the design, material and construction of the guard create a hazard?

## IS IT FREE OF:

- Burrs
- Sharp Edges
- Pinch Points

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# ASSESS YOUR EQUIPMENT FOR HAZARD RISKS

**Use the following checklist to assess your equipment hazards and prioritize your action plans.**

*For each zone listed, assess your risk rating using the following guidelines:*

**A** = Area is unguarded, hazardous conditions exist and guarding is required for compliance

**B** = Area that requires frequent maintenance or clean out and guarding needs upgrading

**C** = Guarding exists but should be improved for compliance

**D** = Not applicable or no hazards exist

Zones that were identified with an **“A or B”** risk rating, present imminent danger to workers in the area and need to be addressed immediately.

Zones that have a **“C”** risk rating should be reviewed with your Supervisors, Workers and your Joint Health & Safety Committee to determine what improvements are required and establish a reasonable time frame for completion.



## A hand is holding a white L-shaped tool against a yellow diamond mesh fence. The tool has text on it, including "GET TOGETHER AGAIN" and "THE BEST". The tool is being used to measure the distance between the fence and a vertical metal post.



ANSI B11 - (American National Standards Institute).



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# DISTANCE FROM POINT OF OPERATION

MAXIMUM OPENING (INCHES)	DISTANCE FROM HAZARD (INCHES)
$\frac{1}{4}$	$\frac{1}{2}$
$\frac{3}{8}$	$2\frac{1}{2}$
$\frac{5}{8}$	$3\frac{1}{2}$
$1\frac{1}{4}$	$6\frac{1}{2}$
$1\frac{7}{8}$	$17\frac{1}{2}$
5	36
Opening over 5" is not recommended	

## Performance Criteria for Safeguarding

ANSI B11 - (American National Standards Institute)

Please complete the form on our [web site](#) to receive a free safety gauge

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# ANY SPECIAL REQUIREMENTS?



**COVER  
ALL THE  
BASES**

- ✓ Lubrication
- ✓ Vibration Analysis
- ✓ Heat Analysis
- ✓ Speed Sensing
- ✓ Corrosive Area
- ✓ Flammable Area

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# ERGONOMIC & MAINTENANCE-FRIENDLY

Design your guards to be ergonomic and maintenance-friendly.

**OSHA states that:**

If possible, machine design should permit routine lubrication and adjustment without removal of safeguards. But when safeguards must be removed, and the machine serviced, the lockout procedure of [29 CFR 1910.147](#) must be adhered to.

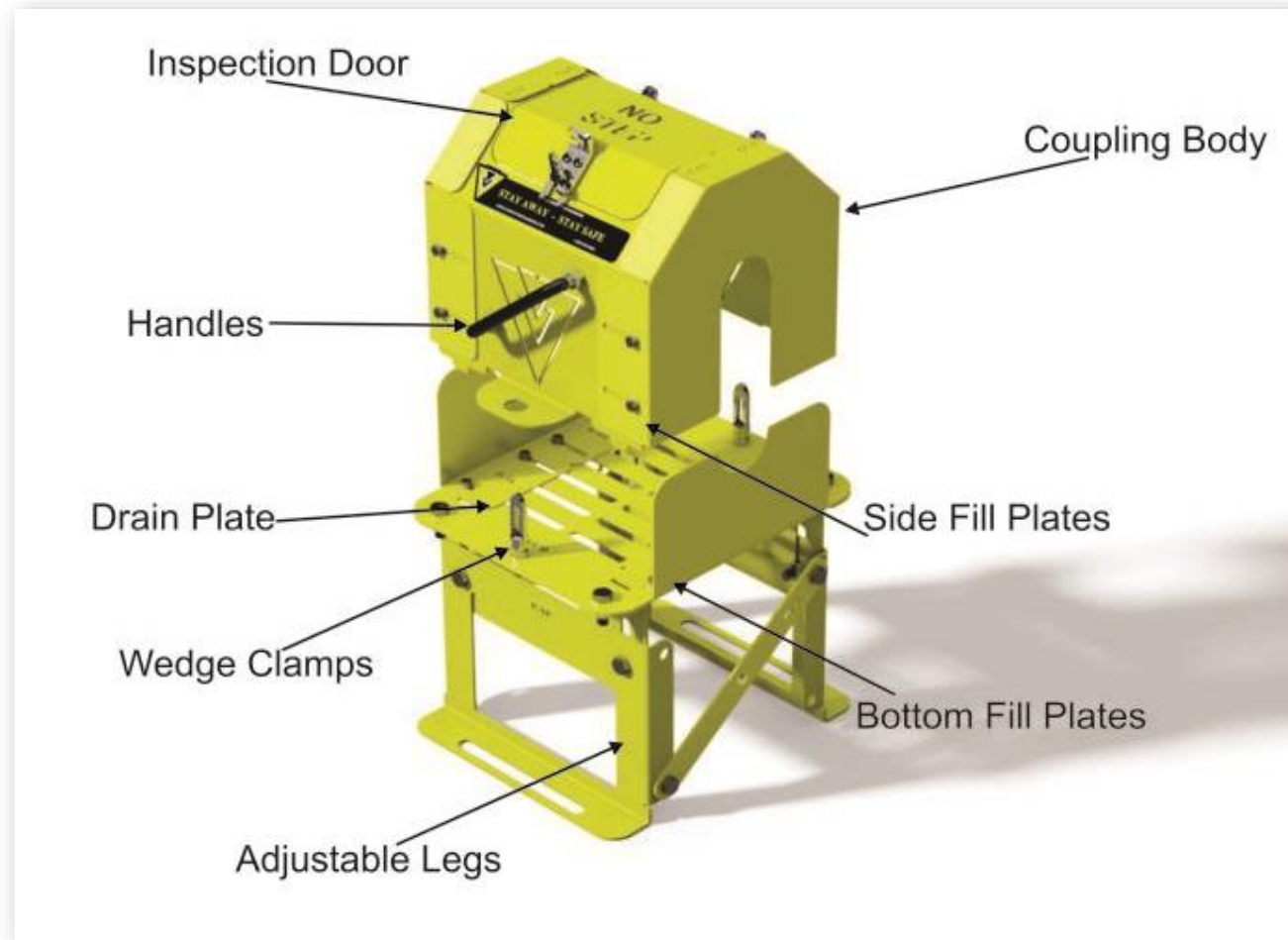
**\*\*The maintenance and repair crew must never fail to replace the guards before the job is considered finished and the machine is released from lockout.\*\***

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# MAINTENANCE-FRIENDLY COUPLING GUARD

This shows how the modular design can be easily disassembled for maintenance.



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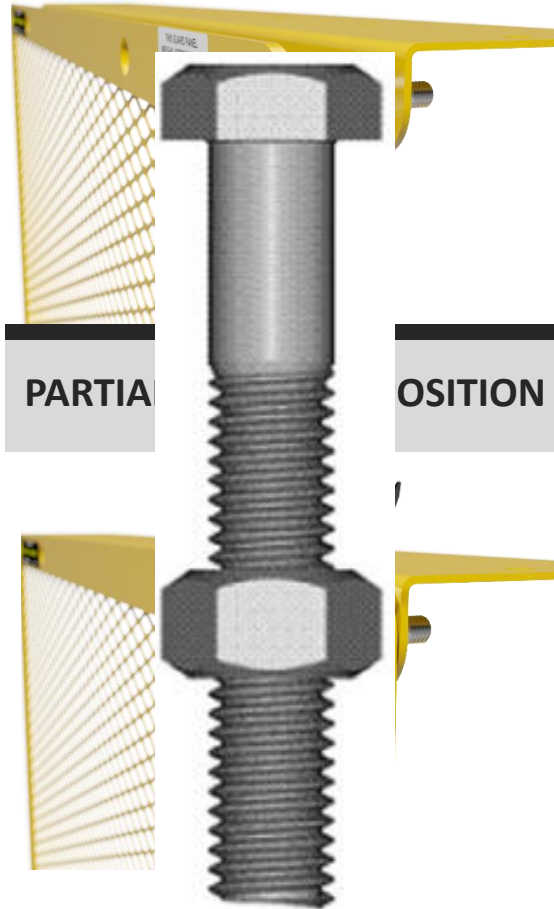


# FASTENING SYSTEM

Bolts are commonly used as fastening systems, but they can rust and often need replacing. Wearing gloves can make it difficult to manipulate them and they can be dropped and lost.



FULLY OPENED POSITION



PARTIA

OSITION



PARTIALLY CLOSED POSITION

**Tie Wrap to Lock:  
ANSI B11 requirement for a  
Tool to Remove**

**REMEMBER TO REPLACE  
THE TIE WRAP**

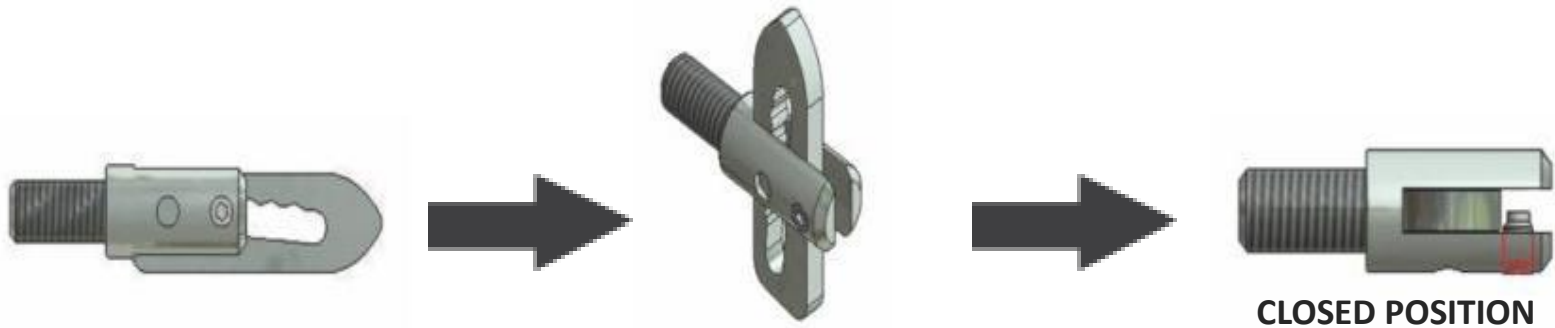
PATENT PENDING

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# LOCKING WEDGE CLAMP

This is designed for applications where using a cable tie is not desirable.  
It requires an Allen key to quickly lock or unlock the set screw.



In open position, set screw allows installation or removal of guards

Locking Wedge Clamp body shows built in set screw

Bird's eye view of set screw tightened, securing the guards in place

PATENTED

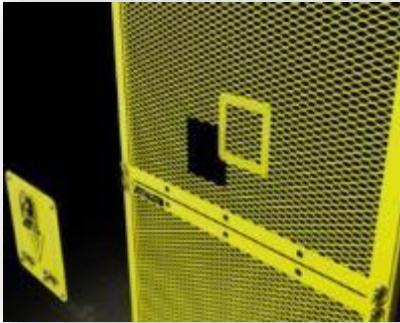
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# BENEFITS OF INSPECTION DOORS

Inspection Doors are necessary when you need to keep machinery running and still want to be able to inspect or access certain areas. The unique 2 piece design allows for retrofitting existing compliant guarding or installing in new.



**HOLE CUT IN GUARD = NON-COMPLIANT**



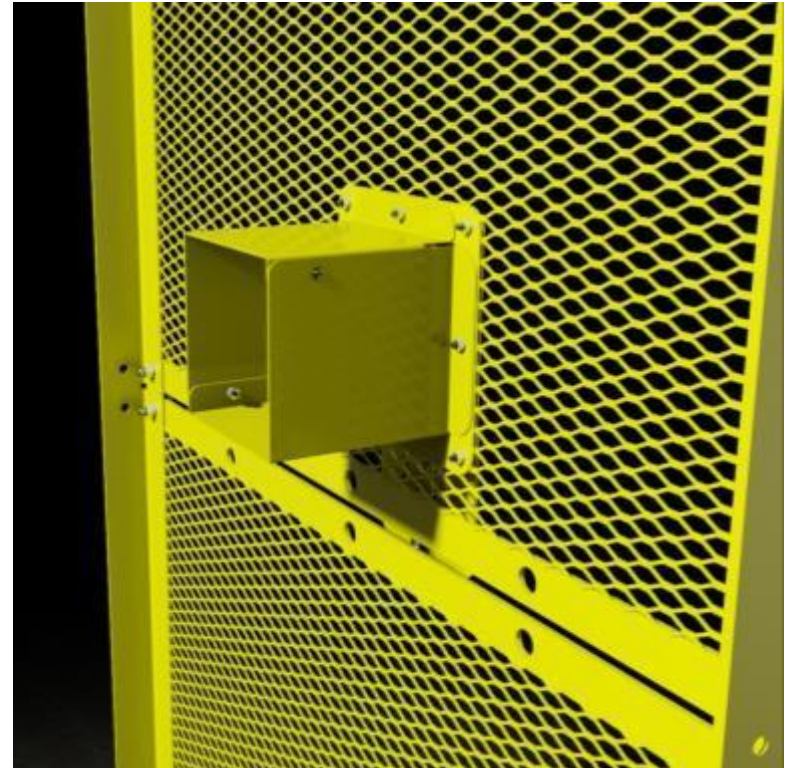
**INSPECTION DOOR = COMPLIANT**

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# INSPECTION DOOR EXTENSIONS

This shows you the optional Inspection door extensions which are also available.  
They can be customized to suite your application.



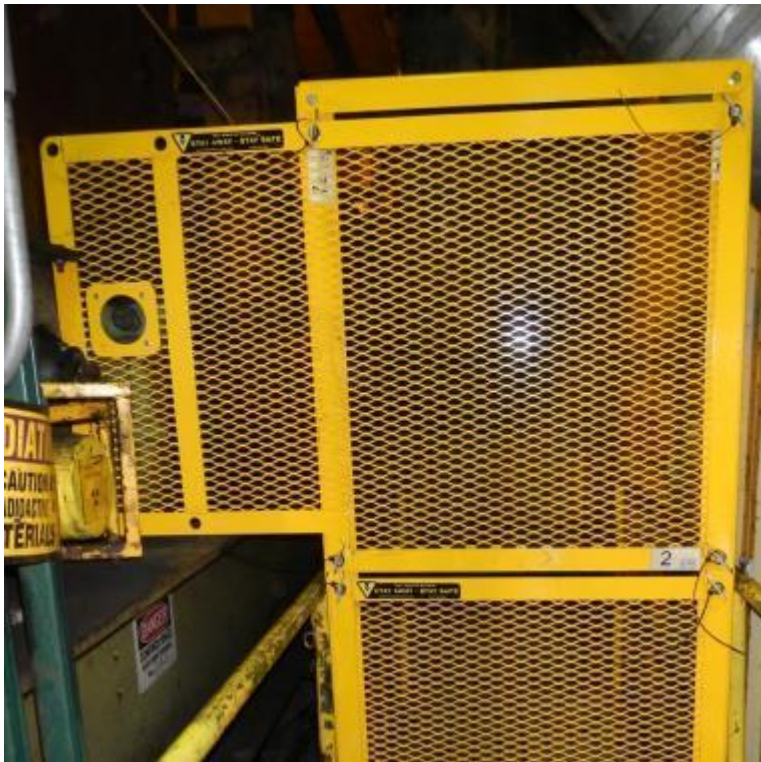
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# ACCESS PORTS

When you need occasional access or if you need continuous or frequent access, use an access port.



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# HINGED FLAT GUARDS

You may have a need for increased access at times when you are properly locked out. Hinging certain areas of the guard will allow for easier access to the equipment for maintenance.



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# ERGONOMICS



- A well designed guard should weigh less than 50 pounds.

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- A guard should not require more than one person to remove or install it.

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- Putting weight labels on all guards will ultimately reduce injuries.



# ERGONOMIC ACCESSORIES



**GUARD HANDLES**



**GUARD SEATS**



**GUARD HANGERS**

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# RECOGNITION

- Is the Guard recognizable as a “Guard”?

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- Paint your guards a color which will stand out from your equipment.

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- Standardize a color which means “Danger”.

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- Safety Yellow is the most common color.



# EDUCATE YOUR WORKERS

## DO YOUR WORKERS KNOW?

1. How to recognize and respect when the equipment needs guarding.
2. How to recognize specific pinch points and rotating hazards in their workspace.
3. If there have been any changes to their workspace.
4. If their old/existing guarding is compliant to today's regulations.
5. How to use the safeguarding and why it is required.
6. How and under what circumstances, can guards be safely removed and when the guards must be replaced.
7. What they should do if a guard is damaged or missing. Who they should notify.





# EDUCATE YOUR WORKERS

One second or less can change a life and the lives of many, forever.  
There is only one winner when an accident happens.



**WINNER**  
=  
**MACHINE**

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# WHAT IS THE RIPPLE EFFECT?

The person who gets hurt or killed is not the only one who is affected by an accident.



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# RIPPLE EFFECT

A Workplace Injury can cause a ripple effect.

Who or what do you think is affected?

Insurance premiums are likely to rise

Employers deal with  
rehiring, retraining, costly fines,  
citations and Workers Compensation

Witnesses may develop PTSD (Post  
Traumatic Stress Disorder)

Colleagues have  
increased workload

Family & friends take  
on extra responsibilities

**WORKPLACE  
INJURY**

**STAY AWAY – STAY SAFE**



ONCE YOU HAVE MADE THE DECISION  
TO GUARD YOUR ROTATING EQUIPMENT  
**- BE SURE TO GUARDSMART.**

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# THANK YOU!



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