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# **Agricultural Equipment Hazards Training**

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# Agricultural Equipment Hazards Training

- Training and Documentation
  - Following this training, you will be given a short quiz.
  - Provide printed documentation of completion for this online training to your supervisor.
  - Supervisors must maintain documentation of the online training and for EACH employee.
  - Refresher training must be taken by an employee if there is an injury from an agricultural equipment hazard. [\[OSHA 29CFR 1928.51\(d\)\]](#)
- Questions about the material

For questions concerning the material, contact:

  - Kent McGuire – CFAES Health and Safety Coordinator at 614-292-0588 or [mcguire.225@osu.edu](mailto:mcguire.225@osu.edu)
  - Or OSU Environmental Health & Safety at 614-292-1284



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# Learning Objectives

- Recognize hazards associated with agricultural equipment
- Discuss eight equipment hazards known to cause injuries
- Identify warning labels used on agricultural equipment
- Demonstrate reaction time as it relates to equipment hazards





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# Equipment Safety

Safety controls and features have been engineered into equipment over the years.



**Compare the two photos.**

Today, the operator area is much safer: less noise, less dust, climate control, roll over protection, protection from debris, and protection from falls. Also consider how safety switches, machine guarding, and warning labels have increased with newer equipment.



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# Equipment Hazards

Even with these advancements, there are eight equipment hazards that operators and bystanders should be familiar with to reduce the likelihood or severity of injury.

Operators must be able to:

- Recognize the hazards
- Respect the hazards
- React appropriately





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# Equipment Hazards

The eight equipment hazards include:

- Wrap Points
- Cut Points
- Pinch Points
- Crush Points
- Free-Wheeling Parts
- Burn Points
- Stored Energy
- Thrown Objects



A piece of equipment can have a variety of these hazards, possibly all of them, and often in multiple locations around the machine.



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# Recognize Equipment Hazards

Manufacturers are required to place warning labels on the equipment where these hazards may be encountered.

- The label will usually include an identifiable pictogram of the hazard
- A piece of equipment can have multiple labels located all over the equipment
- The operator should review these labels and identify the pictograms before working with the piece of equipment





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# Wrap Points

- Wrap Points
  - Exposed (unshielded) rotating machine components
  - Examples include:
    - Power Take Off (PTO) shafts
    - Augers
    - Rotating drive lines
    - Grain / Forage Harvesting Reels





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# Wrap Injuries

- Loose clothing or hair can get entangled in wrap point areas
  - Injuries can range from lacerations, amputations, and multiple fractures
  - Arm, leg, spine and neck injuries are common
  - Injuries could result in death





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# Cut Points

- Cut Points
  - Edges of two moving parts move across the other
  - Single edge move against a stationary edge
  - Injury can be a single cut or multiple cuts up to amputation in severe cases
  - Examples include:
    - Rotary mowers
    - Cutter bars
    - Header attachments
    - Sharp edges



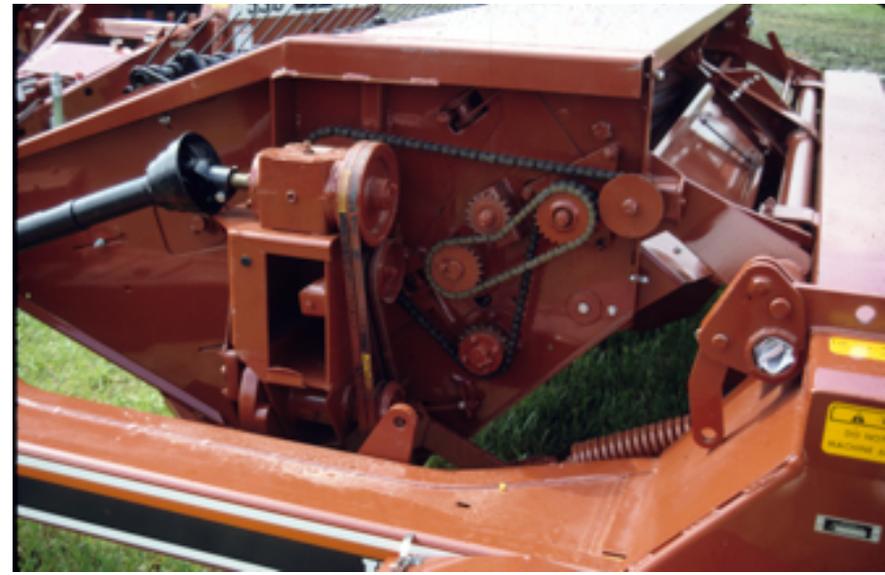


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# Pinch Points

- Pinch Points
  - Two machine parts move together, and at least one of them moves in a circle
  - Injuries to fingers and hands in most cases
  - Examples include:
    - Chain & sprocket
    - Belt and pulley
    - Roller chain assembly





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# Crush Points

- Crush Points
  - Two moving objects moving towards each other
  - A moving object moving towards a stationary object
  - Injury involves blunt trauma to the body
  - Examples include:
    - Raised equipment falling
    - Caught between moving objects





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# Free – Wheeling Parts

- Free-Wheeling Parts
  - Machine parts continue to move after power has been disengaged
  - Operator unintentionally comes into contact with moving parts
  - Injuries include cuts, amputation, or blunt impact
  - Examples include:
    - Mowers / Hay equipment
    - Harvesting equipment
    - Flywheels





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# Burn Points

- Burn Points
  - Thermal burns to skin
  - Occurs during inspection, service or maintenance
  - Examples include:
    - Mufflers
    - Engines
    - Bearing assemblies
    - Worn or broken parts
    - Engine or hydraulic fluids





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# Stored Energy

- Stored Energy
  - Energy is released unintentionally or unexpectedly
  - Involves pressurize systems
  - Injuries can include blunt trauma, burns, punctures or electrical shock
  - Examples include:
    - Spring tension
    - Hydraulic systems
    - Electricity
    - Chemical reaction





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# Thrown Objects

- Thrown Objects
  - Any material or object thrown by equipment
  - Injuries from being struck by object at high velocity
  - Examples include:
    - Harvest debris
    - Manure spreaders
    - Rotary mowers





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# Reacting to Equipment Hazards

We react differently to different situations.

- We jump when startled
- Raise our hands to catch something
- We duck or turn away to protect our face

But...Can we react quick enough to prevent injury?

- Average person's reaction time to a potential hazard is 0.2 to 0.3 seconds
- The time can increase to over 1 second if the person is not paying attention or distracted

**So... let's put this in perspective!**





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# Reacting to Equipment Hazards

**Below are the potential actions from the equipment hazards.  
How would you react?**

## Cut Points

0.2 of a second  
=  
10 CUTS



## Pinch Points

0.2 of a second  
=  
Pulled in 14 Ft.



## Wrap Points

0.2 of a second  
=  
Wrapped 2 Ft.



## Free-Wheeling Parts

Some equipment could  
take up to 2.5 min. to  
come to a complete  
stop





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# Reacting to Equipment Hazards

Below are the potential actions from the equipment hazards.  
How would you react?

## Burn Points

- 124°F takes 3 min. for 3<sup>rd</sup> degree burn
- 140°F takes 5 sec. for 3<sup>rd</sup> degree burn



## Crush Points

0.2 of a second  
=  
Object Falls 1 Foot  
(based on gravity)



## Stored Energy

Can include hydraulic, electrical, chemical, or spring tension



## Thrown Objects

Any material or object that can be thrown by equipment





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# General Safety Procedures

## **Considerations when working around equipment**

- Read and follow the operators manual.
- Review and understand the warning labels.
- Shut down equipment when inspecting or making repairs.
- Allow time for frictional moving parts, engines, mufflers and fluids to cool before servicing equipment.
- Install all shields or machine guards after servicing.
- Use Personal Protective Equipment (PPE) such as gloves and safety glasses when performing maintenance or repairs.
- Lock-out or dissipate any stored energy when equipment is not in use.



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# General Safety Procedures

## **Considerations when working around equipment**

- Do not leave the operator compartment until everything comes to a stop.
- Use cylinder locks when working under raised equipment.
- Avoid being in the discharge path of equipment throwing debris.
- Keep hands and fingers away from sprocket assemblies, pulley assemblies, or rotating parts.
- Avoid loose clothing, hood drawstrings, or long hair around moving parts.
- Stay clear of exposed augers, PTO shafts or drive lines while in use.



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# How can you minimize equipment hazards

- No matter how FAST you are.... Equipment is always FASTER! Respect it!
- Recognize the warning labels.
- Understand the hazards and proper safety practices needed for the machinery you are operating.





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- Visit OSU Ag Safety and Health at [www.agsafety.osu.edu](http://www.agsafety.osu.edu)

## Reference

- National Safe Tractor and Machinery Operation Program, Hazardous Occupations Safety Training in Agriculture. Penn State University, Ohio State University, and National Safety Council
- OSHA 29CFR1910 and 29CFR1928





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# Agricultural Equipment Hazards Training

You have completed the Agricultural Equipment Hazards Training, click below to begin the progression quiz: