AGRICULTURAL SAFETY

BY CLEMSON® EXTENSION

Agricultural Safety Field Day Handbook

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Introduction

For many years, the U.S. Department of Labor (DOL) has identified many agricultural tasks as hazardous to our young people (US Dept. of Labor, 2017). Nearly 300 American children are killed each year in farming accidents alone (NASD, 2017). Thousands more are injured. Youth who have a tie to agriculture have the potential to be exposed early to the dangers of agricultural operations and equipment if they are around adults who operate them (McCallum, Conaway & Reynold, 2009). However, youth not exposed to this type of activity may have a decreased awareness of safety practices with all equipment. As many of our youth do not grow up with an agricultural background, they are losing the skills required to be competent in operating traditional agricultural equipment but also other necessary equipment (including string trimmers, chain saws, lawn mowers, etc.) to be productive homeowners or agricultural workers. Data from a study in 2016 (Schafbuch, Vincent, Mazur, Watson, and Westneat) examined the CROPS (Cost-effective Rollover Protective Structure) curriculum, suggesting that agricultural mechanics teachers can impact students' knowledge about equipment safety practices. In a separate study in 2006 (McCallum, Reynolds, Kelley, Conaway & Braune, 2006), researchers found that farm safety day camps had a direct impact on participants' knowledge and safety awareness, in addition to a broader dispersion of safety information due to the involvement of community members.

Information will aid in the students' knowledge, awareness, and attitude necessary to become an effective supervisor, manager, employer, employee, or educator of safety topics in the agriculture field. Students will learn how to engineer and enforce strategies to promote a safe work environment. The purpose of this booklet is to strategically develop a high-impact approach for raising equipment safety awareness in youth and adults. This booklet, along with the day-long safety camp, will better prepare the student for work in the agricultural industry in South Carolina.

OBJECTIVES: The overall objective of the course is to increase awareness of safety procedures, maintenance operations and change the students' habits of safety operations. Additional objectives are as follows:

- Increased awareness of small and large equipment safety operations.
- Improved accessibility to resources needed to practice safe operations of such equipment.
- Increased awareness of daily operations of large and small equipment maintenance

Personal Protective Equipment (PPE) Tools and Equipment

PPE is considered by the industry as the LAST LINE OF DEFENSE when protecting yourself from the various hazards associated with agricultural tasks.

Symbols used to represent PPE vary significantly from source to source. For this notebook, we will use the following symbols with the following meanings:

Hard Hat/Bump Cap: This symbol indicates that a user wears a hard hat or bump cap while performing tasks with this machinery/tool. The symbol to the left also indicates that a hard hat or bump cap may be required in a specific area where machinery and falling objects may be present.

Hearing Protection: This symbol indicates that the tool/equipment used will create noise levels at or above 85 decibels, which is the noise level where hearing loss occurs. Hearing protection NEEDS to be worn when using this tool or equipment.

Steel or Composite, Closed-Toe Shoes: This symbol indicates that closed-toe shoes (preferably leather) should be worn when using this tool or equipment. It is also highly recommended that the shoe have a steel or composite toe to prevent pinch and crush injuries.

Safety Glasses: This symbol indicates that safety glasses should be worn at all times when using this tool or equipment.

Gloves: This symbol indicates that gloves should be worn when using this tool or equipment or performing specific tasks. The person conducting the task should be aware of any particular labeling that indicates if a particular type of glove or hand protection should be worn.

No Gloves: This symbol indicates that the user of the tool or equipment should not wear gloves. Wearing gloves during the operation of this tool or equipment could cause severe injury and loss of a limb in the case of an incident.

Dust Mask: This symbol indicates that the tool or machinery being used can create an unfavorable atmosphere around the user. There is potential for dust or other allergens to become suspended in the air when in use.

Face Shield: This symbol indicates that a face shield should be used when using this tool or equipment. A face shield is typically associated with tools that cause splatter or projectile materials when being used.

Hi-Vis Safety Vest: This symbol indicates that a high visibility safety vest should be worn when using this tool or operating this equipment. It can also mean that this PPE should be worn in specific areas such as worksites where moving equipment and multiple other workers are present.

Safe Operational Procedures for Tools and Equipment Common in Agricultural Worksites

Electric Power Tools

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Angle Grinder

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is an angle grinder the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the angle grinder safely?
- ✓ Are the required PPE present and on?
- ✓ **Side Handle:** Handle is attached securely, no cracks, not broken.
- ✓ **Wheel Guard:** Guard attached securely, correct size, proper type, not bent, broken, cracked, or altered.
- ✓ **Specifications label:** Label is present and clear to read.
- ✓ **Accessory:** Use only accessories that match the diameter and equal or exceed the speed rating (RPM) found on the specification label. Check for cracks, warping, chipping, and signs of abuse, and replace if needed.
- ✓ **Mounting Hardware:** Proper flanges are being used; flange is not worn or warped; raised area of flange sits securely into the accessory. Threaded spin-on accessories match the thread of the grinder spindle. Be sure that the spanner wrench fits the locking flange and is the proper wrench for the tool.
- ✓ **Power Cord (If present):** Cord has no breaks, kinks, pinches, splices, frayed areas, exposed wires. The prongs on the plug are not bent.
- ✓ **ON/OFF Switch:** Switch works properly and is free.
- ✓ **Spindle Lock:** Lock moves freely and locks spindle when pressed.

OPERATION OF TOOL

- ✓ Ensure the workpiece is adequately secured.
- ✓ Keep both hands on the grinder and maintain good posture.
- ✓ Check for bystanders before engaging the workpiece and place shields around the workpiece if needed.
- ✓ Engage the workpiece firmly and slowly.
- ✓ If the angle grinder accessory grabs the material and pulls the grinder away from you, pull up and away firmly.
- ✓ Use cutting disks only for cutting, not grinding.
- ✓ Have pliers or tongs at the ready to handle hot materials.

ENDING OPERATIONS

- ✓ Allow accessory to stop before setting the grinder down fully.
- ✓ Ensure no foreign material is present on the tool.
- ✓ Wrap the cord around the handle of the grinder to ensure that the cord does not get damaged.
- ✓ Store tools in the designated area out of access for children and those not trained to operate the tool.
- ✓ Ensure the workpiece is free of burrs.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.

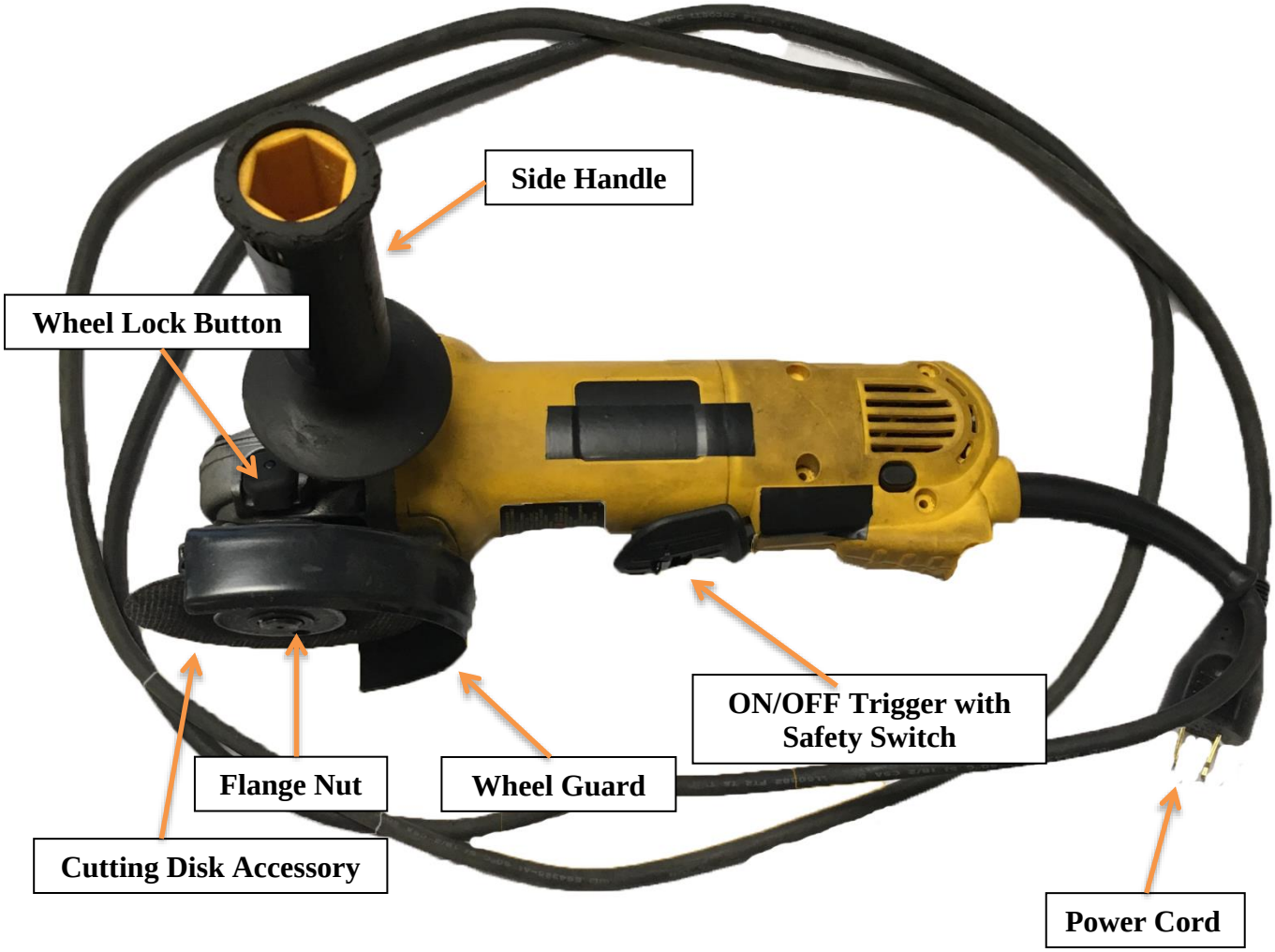
POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Pinch, crush, and cut points
- ⓘ Contact with sharp objects
- ⓘ Vibration
- ⓘ Falling materials
- ⓘ Electrical shock

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not send sparks in the direction of a bystander.
- ✘ Do not use accessories larger than what the label permits.
- ✘ Never use the tool one-handed.
- ✘ Never wear gloves while operating the tool.
- ✘ Never use the tool on or near flammable materials.

Major Components of a Corded Angle Grinder



Angle Grinder Accessories

There are many different types of angle grinder accessories. Below are a few of the common types of wheels used with angle grinders. Grinding wheels and abrasive cut-off wheels are the most common wheels used and are the most misused. Abrasive cut-off wheels are used only for cutting material, not grinding. They are much thinner than grinding wheels, much more fragile, and are susceptible to shattering if used as a grinding disc.

Flap Disc **Metal and Concrete** **Wire Wheel** **Wire Brush Wheel**

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety Safe Operational Procedure (SOP)

Bench Grinder

***DO NOT* use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a bench grinder the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the bench grinder safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure long hair is tied back and loose clothing is pulled back or removed.
- ✓ **Safety Shield:** Shield is present and in place such that it blocks projected material from coming towards the operator. The shield is transparent enough to see the workpiece safely.
- ✓ **Wheel Guard:** Wheel guard is attached securely, correct size, proper type, not bent, broken, cracked, or altered.
- ✓ **Labels:** Warning labels are present and clear to read.
- ✓ **Grinding Wheel:** Undamaged and uniform in shape. No cracks or large chips are missing from the face. The face is flat. The wheel is an appropriate size for the grinder.
- ✓ **Work Rest:** Work rest is roughly 1/8th inch away from the face of the wheel.
- ✓ **Power Cord:** No breaks, kinks, pinches, splices, frayed areas, exposed wires. The prongs on the plug are not bent.
- ✓ **ON/OFF Switch:** Switch works properly and is free.

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured. Vise-grip pliers are used if the workpiece is too small to hold with hands safely.
- ✓ Keep workpiece in contact with work rest.
- ✓ Keep both hands on the workpiece and maintain good posture.
- ✓ Check for bystanders before engaging the workpiece and place shields around the workpiece if needed.
- ✓ Engage the workpiece firmly and slowly.
- ✓ If the workpiece gets caught in the grinder, pull your hands away quickly and turn the grinder off immediately.
- ✓ Have pliers or tongs at the ready to handle hot materials.
- ✓ Quench workpiece in cool water often to prevent changing the hardness of the metal.

ENDING OPERATIONS

- ✓ Turn off the grinder and allow it to stop on its own. Stopping with an object could cause damage to the wheel.
- ✓ The lock switch on the tool, if able, prevent children and unauthorized users from turning it on.
- ✓ Ensure the workpiece is free of burrs.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.
- ✓ Sweep all dust created from grinding. Built-up dust in the work area can create a slip hazard.

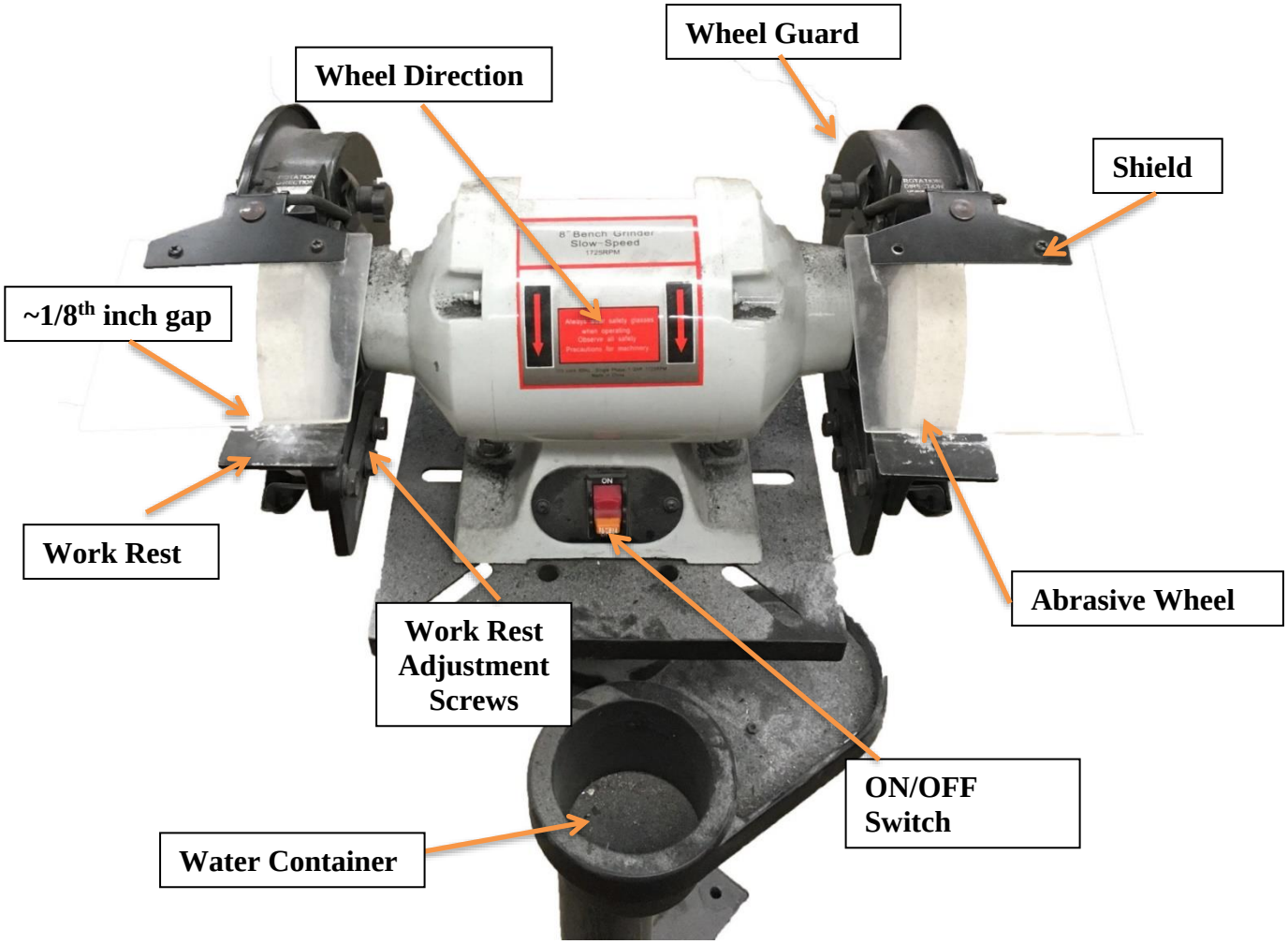
POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Pinch, crush, and cut points
- ⓘ Contact with sharp objects
- ⓘ Vibration
- ⓘ Electrical shock
- ⓘ Contact with an abrasive wheel
- ⓘ Dismemberment

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not use other wheels than what the label permits.
- ✘ Never use the tool one-handed.
- ✘ Never wear gloves while operating.
- ✘ Never use on or near flammable materials.
- ✘ Do not allow the grinder to continue to run if the material is caught in the wheel (causes premature damage to motor).
- ✘ Never leave grinder on and unattended.

Major Components of a Bench Grinder



Bench Grinder Accessories

There are many different types of bench grinder accessories. Below are a few of the common types of wheels used with bench grinders. Aluminum oxide wheels are the most common and usually used for grinding tough metals.

Aluminum Oxide Wheel

Silicon Carbide Wheels

Fine Wheels

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Circular Saw

DO NOT **use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a circular saw the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the angle grinder safely?
- ✓ Are the required PPE present and on?
- ✓ **Handle:** Handle attached securely, no cracks, not broken.
- ✓ **Stationary Guard:** Guard attached securely, not bent, broken, cracked, or altered.
- ✓ **Blade Guard Lever:** Lever is present and undamaged.
- ✓ **Front Handle:** Handle present, unbroken, and in good condition.
- ✓ **Base Plate:** Plate set to appropriate angle for the cut, undamaged, no cracks.
- ✓ **Arbor:** Blade is mounted securely; the arbor is not cracked or damaged.
- ✓ **Power Cord (If present):** Cord has no breaks, kinks, pinches, splices, frayed areas, exposed wires. The prongs on the plug are not bent.
- ✓ **ON/OFF Switch:** Switch works properly and is free.
- ✓ **Adjustable Blade Guard:** Guard moves freely, undamaged, and completely covers blade when deployed; returns to set position when saw is not in use.

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Keep both hands on the saw and maintain good posture.
- ✓ Check for bystanders before engaging the workpiece and place shields around the workpiece if needed.
- ✓ Check for knots or other areas that would cause the saw to bind.
- ✓ Ensure the power cord will not come into contact with the blade.
- ✓ Engage the workpiece firmly and slowly.
- ✓ If the saw binds, let go of the trigger and allow the saw blade to come to a stop before removing the saw from the workpiece.

ENDING OPERATIONS

- ✓ Allow accessory to stop before fully lifting the saw out of the workpiece.
- ✓ Ensure no foreign material is present on the tool.
- ✓ Wrap the cord around the saw to ensure that the cord does not get damaged.
- ✓ Store tools in the designated area out of access for children and those not trained to operate the tool.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.

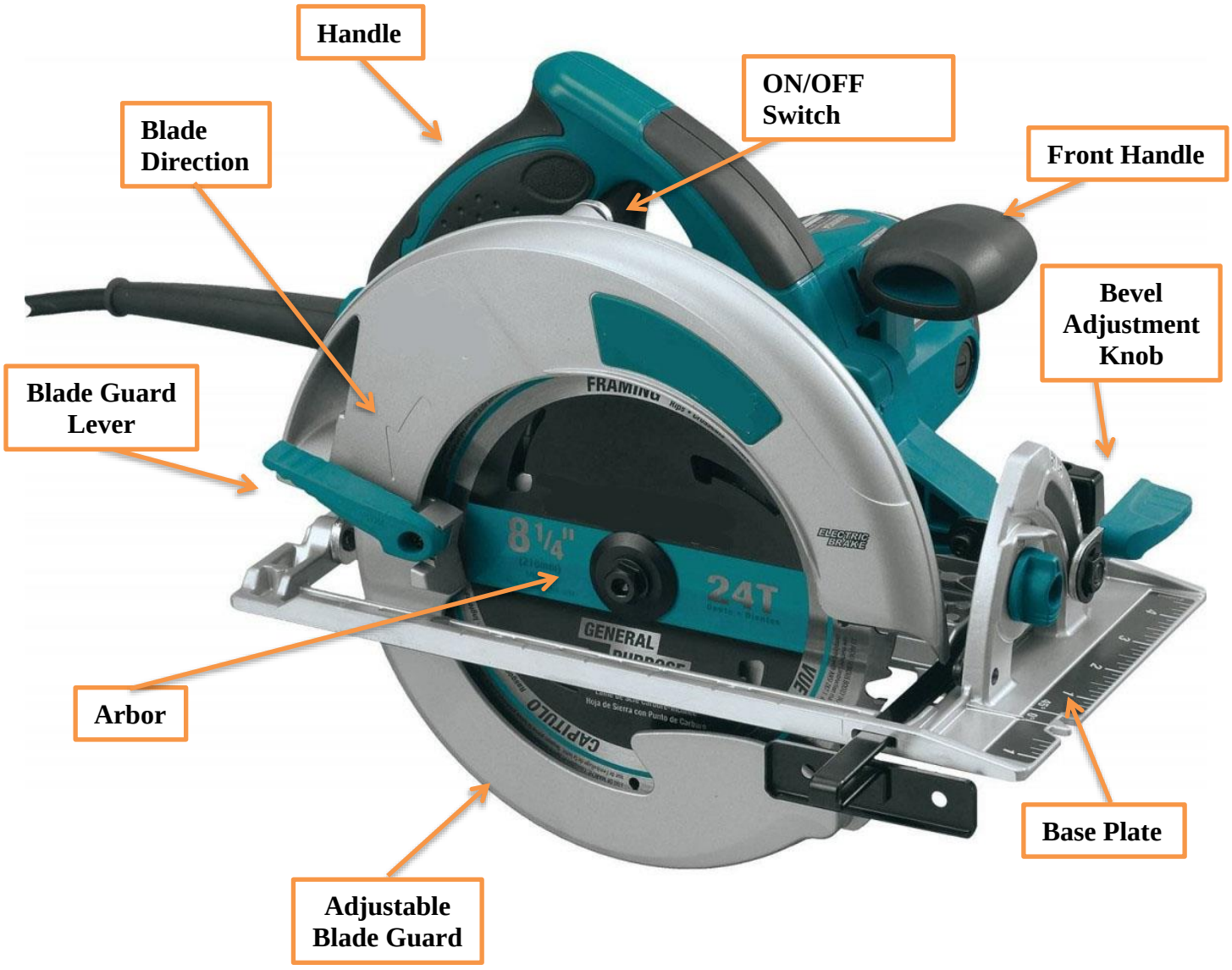
POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Pinch, crush, and cut points
- ⓘ Contact with sharp objects
- ⓘ Vibration
- ⓘ Falling materials
- ⓘ Electrical shock

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never use the tool one-handed.
- ✘ Never use the tool on or near flammable materials.
- ✘ Never lay the tool on the workpiece when cutting.
- ✘ Never cut towards your body.
- ✘ Never alter or remove blade guards

Major Components of a Circular Saw



AGRICULTURAL SAFETY
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Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Power Hand Drill

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a power hand drill the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the power drill safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure the work area is secure and clean.
- ✓ Ensure long hair is tied back and loose clothing is pulled back or removed.
- ✓ **Power Cord (If present):** Cord has no breaks, kinks, pinches, splices, frayed areas, exposed wires. The prongs on the plug are not bent.
- ✓ **ON/OFF Switch:** Switch works properly and is free.

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Keep both hands on the drill and maintain good posture.
- ✓ Check for bystanders before engaging the workpiece and place shields around the workpiece if needed.
- ✓ Engage the workpiece firmly and slowly.
- ✓ If the power drill accessory grabs the material and twists the drill in your hand, let go of the trigger and regain control.
- ✓ Only use power drill accessories that are appropriate for the task at hand.
- ✓ Have pliers or tongs at the ready to handle hot materials.

ENDING OPERATIONS

- ✓ Place directional switch above trigger to the center lock position.
- ✓ Ensure no foreign material is present on the tool.
- ✓ Wrap the cord (if present) around the handle of the drill to ensure that the cord does not get damaged.
- ✓ Store tools in a designated area out of access for children and those not trained to operate the tool.
- ✓ Ensure the workpiece is free of burrs.

CLEANING UP

- ✓ Sweep work area thoroughly.
- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of.
- ✓ Remove bit/accessory and store in its proper location.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Pinch, crush, and cut points
- ⓘ Contact with sharp objects
- ⓘ Vibration
- ⓘ Falling materials
- ⓘ Puncture
- ⓘ The workpiece may spin and contact the body
- ⓘ The drill may catch the workpiece, and the drill handle may spin

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not use drill above or near flammable materials.
- ✘ Do not drill into pressurized vessels.
- ✘ Do not use accessories not intended for use in a power drill.
- ✘ Avoid using the tool one-handed if at all possible.
- ✘ Do not wear gloves or have loose clothing or long hair exposed to the spinning accessory on the drill

Major Components of a Cordless Power Hand Drill

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety Safe Operational Procedure (SOP)

Reciprocating Saw

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a power reciprocating saw the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the power drill safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure the work area is secure and clean.
- ✓ Ensure long hair is tied back and loose clothing is pulled back or removed.
- ✓ **Power Cord (If present):** Cord has no breaks, kinks, pinches, splices, frayed areas, exposed wires. The prongs on the plug are not bent.
- ✓ **Trigger:** Trigger works properly and is free.
- ✓ **Blade Release:** Release works properly and is free; securely locks the blade into the saw and prevents it from slipping out or being loose.

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Keep both hands on the saw and maintain good posture.
- ✓ Ensure that the shoe is firmly pressed against the workpiece to prevent the reciprocating action of the saw from transferring intense vibration to the operator.
- ✓ Engage the workpiece firmly and slowly.
- ✓ If the blade catches the material and pushes/pulls the saw from your hands, cease operation and regain control of the saw.
- ✓ Only use accessories that are made for reciprocating saws and that are appropriate for the task at hand.
- ✓ Have pliers or tongs at the ready to handle hot materials.
- ✓ Use caution when touching materials cut with a reciprocating saw, as the saw blade can cause large splinters to occur on the workpiece.

ENDING OPERATIONS

- ✓ If the device is equipped with one, use the switch lock to prevent accidental engagement of the saw blade.
- ✓ Ensure no foreign material is present on the tool.
- ✓ Wrap the cord (if present) around the handle of the saw to ensure that the cord does not get damaged.
- ✓ Store tools in the designated area out of access for children and those not trained to operate the tool.
- ✓ Ensure the workpiece is free of burrs and splinters.

CLEANING UP

- ✓ Sweep work area thoroughly.
- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of.
- ✓ Remove blade/accessory and store in its proper location.
- ✓ If blade/ accessory is damaged beyond future use, dispose of blade/accessory to prevent others from using faulty equipment.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Pinch, crush, and cut points
- ⓘ Contact with sharp objects
- ⓘ Intense vibration
- ⓘ Falling materials
- ⓘ Puncture
- ⓘ A workpiece may vibrate uncontrollably

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not use above, on, or near flammable materials.
- ✘ Do not saw into pressurized vessels.
- ✘ Do not use accessories not intended for use in a reciprocating saw.
- ✘ Avoid using the tool one-handed.
- ✘ Never change blade/ accessory with the battery on the tool.
- ✘ Never use damaged or broken saw blades/ accessories.

Major Components of a Reciprocating Saw

Reciprocating Saw Accessories

****There are many different attachments and accessories to be used with reciprocating saws. It is essential always to choose the attachment that is appropriate and designed for the task at hand. The yellow blade above is wood-only. This blade has larger teeth meant for cutting soft materials. The white blade is metal-only. The teeth are much smaller, and there are many more teeth on this blade. This blade will not cut wood well and is more susceptible to catching on fire than cutting it. The attachments to the right are scrapers and are designed to remove material from a flat surface. It is important always to check the material you are working with for splinters and burrs after cutting.**

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Compound Sliding Miter Saw

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a compound sliding miter saw the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the power drill safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure the work area is secure and clean.
- ✓ Ensure long hair is tied back and loose clothing is pulled back or removed.
- ✓ **Power Cord (If present):** Cord has no breaks, kinks, pinches, splices, frayed areas, exposed wires. The prongs on the plug are not bent.
- ✓ **ON/OFF Switch:** Switch works properly and is free.
- ✓ Ensure the table is set to the correct angle and is in a locked position.
- ✓ Check to make sure the blade is on correctly and the nut is tight.

OPERATION OF MACHINE

- ✓ Ensure the workpiece is properly secured.
- ✓ Keep a firm grip on the handle and maintain good posture.
- ✓ Engage the workpiece firmly and slowly.
- ✓ If the saw grabs the workpiece and pulls it away from you, cease operation and readjust the workpiece against the fence to prevent movement of the workpiece.
- ✓ Allow the saw to cut through the material with ease; do not overload the saw; listen to the motor.

ENDING OPERATIONS

- ✓ Remove workpiece and other materials from saw table.
- ✓ Lower saw to a closed position and engage the saw pivot lock, so the saw remains in a closed, safe position.
- ✓ Lock the handle of the saw so the blade cannot be turned on.
- ✓ Ensure the workpiece is free of splinters.
- ✓ Return table to the 0-degree position.

CLEANING UP

- ✓ Sweep work area thoroughly.
- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of.
- ✓ Use a vacuum to remove all dust from the saw.

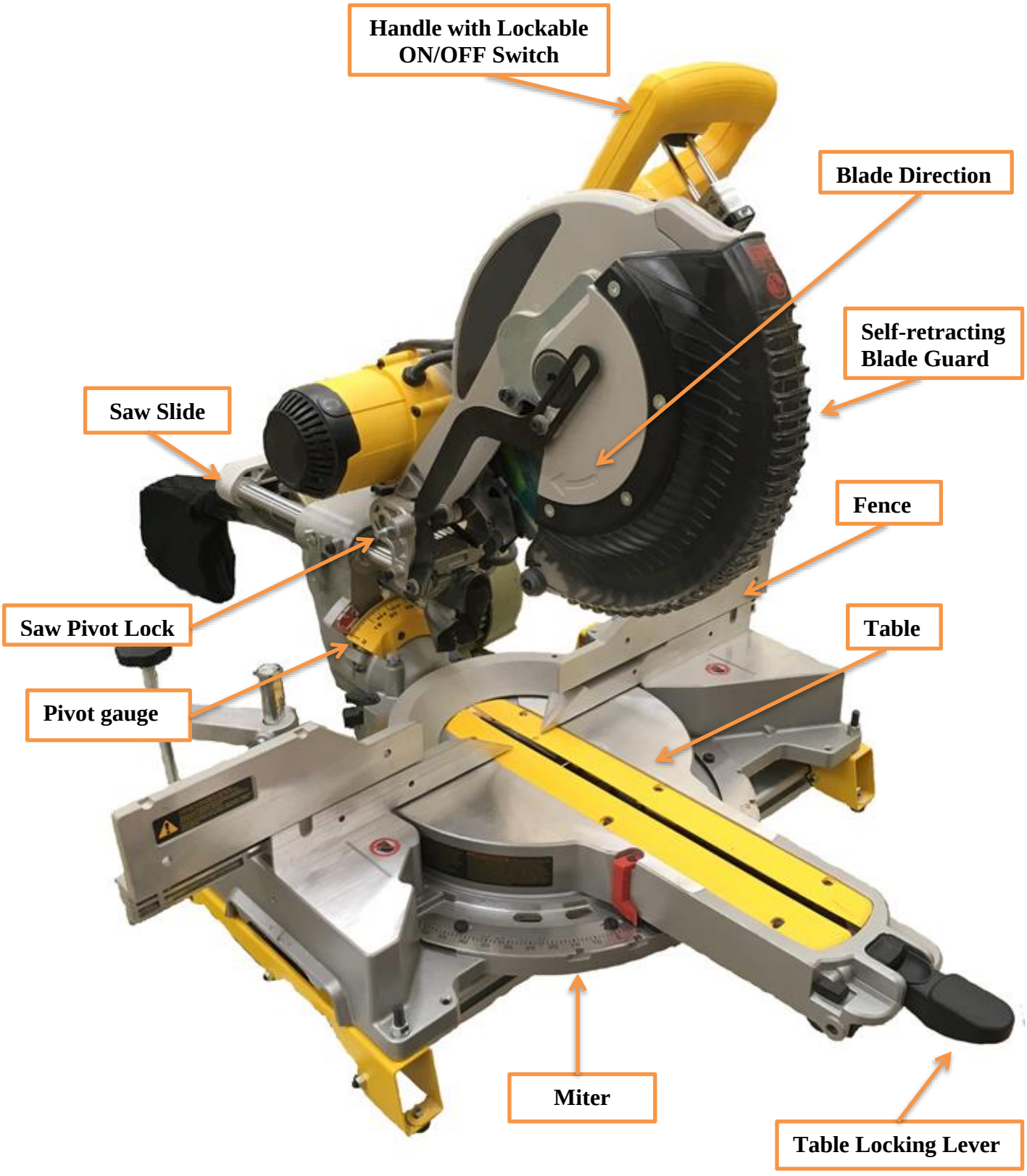
POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Fire hazard
- ⓘ Injury to workers nearby
- ⓘ Pinch, crush, and cut points
- ⓘ Contact with sharp objects
- ⓘ Vibration
- ⓘ Puncture
- ⓘ A workpiece may move suddenly and contact the operator
- ⓘ Intense friction from dull blade could cause fire
- ⓘ Loss of limb(s)

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not cut into pressurized vessels.
- ✘ Do not wear gloves or have loose clothing or long hair exposed to the workpiece or saw.
- ✘ Never put body parts within the colored zone around where the blade enters the table (yellow zone on the following image).

Major Components of a Compound Sliding Miter Saw



AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Table Saw

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ If using a fence, make sure the fence is parallel to the blade.
- ✓ Ensure the blade is at the desired angle. Check with a square while the machine is properly locked out. The blade should be at 90 degrees from horizontal for square cuts.
- ✓ Ensure blade guard is in good condition and anti-kickback pawls are in place before turning on the machine.
- ✓ Before starting the table saw, ensure the saw height is set properly to just above the stock (no more than ¼") and the blade is locked in place.
- ✓ Make sure the emergency stop button works.
- ✓ Ensure all body parts, clothing, hair, jewelry, and other objects are clear of the work area and other moving parts before starting the machine is engaging in moving parts.
- ✓ Ensure all work holders, clamps, and vices are tightened enough to hold the stock while working.
- ✓ Report any faulty equipment immediately.

OPERATION OF TOOL

- ✓ Always use steady force and avoid too much pressure on the material to be cut.
- ✓ Push steadily into the blade to prevent kickback and bind the material between the saw blade and the fence.
- ✓ Always use a push stick when ripping and the fence when cross-cutting material.
- ✓ Use miter gage when cross-cutting materials. Never cut wood-free hand.
- ✓ Stand to the side, never directly behind the blade.
- ✓ Never use a fence and miter gauge at the same time.
- ✓ Use proper saw blade for the material being cut.
- ✓ Keep the workpiece flat on the table at all times.

ENDING OPERATIONS

- ✓ Turn off and disconnect from the power source and follow lockout/tag-out procedures.
- ✓ Replace any dull or chipped blades.
- ✓ Lower blade back into the table and put fence over it.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Pinch points
- ⓘ High sound levels
- ⓘ Flying materials
- ⓘ Contact with sharp materials

DON'T

- ✘ Do not freehand.
- ✘ Do not wear gloves.
- ✘ Do not feed the workpiece faster than the saw can accept.
- ✘ Do not lift the guard or work near the blade while it is turning.
- ✘ Never leave saw running unattended.

Major Components of a Table Saw

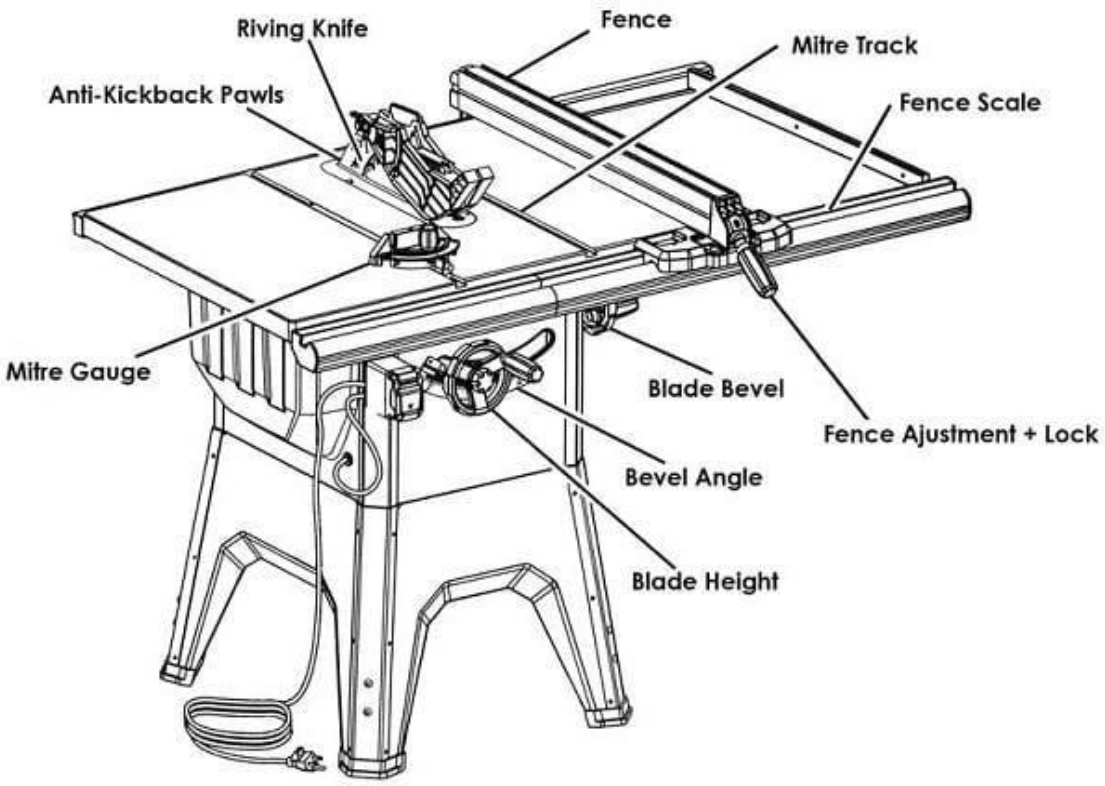

Table Saw Accessories

There are many different types of table saw accessories. Miter gauges, crosscut sled, and feather boards are just a few. Feather boards hold the wood against the table saw fence and the tabletop. A miter gauge helps hold the wood when cutting at an angle.

Miter Gauge

Crosscut Sled

Feather Boards

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Cut-Off Machine (Chop Saw)

DO NOT **use this tool unless you have been instructed in its safe use and operation and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a cut-off machine the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the cut-off machine safely?
- ✓ Are the required PPE present and on?
- ✓ Remove all scraps from around the blade before using the saw.
- ✓ Inspect the blade for damage.
- ✓ Make sure the swing arm is functioning correctly.
- ✓ Inspect electrical cord and plug for defects.

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Check for bystanders before engaging the workpiece and place shields around the workpiece if needed.
- ✓ Always make sure material is held in place against the fence.
- ✓ Allow the blade to reach full speed before attempting to cut.
- ✓ The user should almost always hold material with the left hand while controlling the saw with the right hand.
- ✓ Do not in front of the blade while cutting.

ENDING OPERATIONS

- ✓ Do not leave the area of the machine until the blade has come to a complete stop.
- ✓ Ensure no foreign material is present on the tool.
- ✓ Store tools in a designated area out of access for children and those not trained to operate the tool.
- ✓ Ensure the workpiece is free of burrs.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.
- ✓ Remove chips, scraps, and cut-offs.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Severe cuts and amputations
- ⓘ Wheel shatter hazard
- ⓘ Potential for loose items to become entangled
- ⓘ Pinch point hazards
- ⓘ Flying sparks
- ⓘ Dust exposure
- ⓘ Noise exposure

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never allow hands or fingers closer than 6" to the blade.
- ✘ Never cut any material shorter than 8".
- ✘ Never attempt to cut any material not held firmly in place.
- ✘ Never remove or hold the guards out of the way while using the saw.

Major Components of a Chop Saw

Chop Saw Accessories

There are many different types of chop saw accessories. The first accessory below is an ultra-fine blade with 100 teeth. This blade produces a much cleaner cut than the stock blade that comes with the chop saw. The following accessory is used to collect dust. One major problem with chop saws is that they produce a lot of dust. The dust bags that come with the saw do not always collect all the dust; however, a dust solution should collect most of it. The last accessory below is not necessarily needed for your saw to function, but it can make the saw operation much easier and more precise. The laser marker will show a straight line across the material exactly where it will need to be cut.

100 tooth ultra-fine blade

Dust Solution

Laser Marker

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Jointer

DO NOT **use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a jointer the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the jointer safely?
- ✓ Are the required PPE present and on?
- ✓ Always run dust collection with the jointer.
- ✓ Make sure all guards are in place and functioning correctly.
- ✓ Check materials for defects and metal.
- ✓ Ensure the power supply is sufficient.
- ✓ Ensure fence is locked incorrect location.
- ✓ Ensure the table is cleared of objects and stock is not in contact with cutter heads.

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Turn on dust collection and jointer.
- ✓ Ensure the cutter head is at full speed before running the piece.
- ✓ Run stock through jointer with even pressure against fence.
- ✓ Always joint with the grain.
- ✓ On long pieces, walkthrough with the board.
- ✓ Turn the cup of board concave down.

ENDING OPERATIONS

- ✓ Turn off jointer.
- ✓ Shut blast gate/guard and turn off dust collection.
- ✓ Wait until the jointer comes to a complete stop and clean around the jointer.

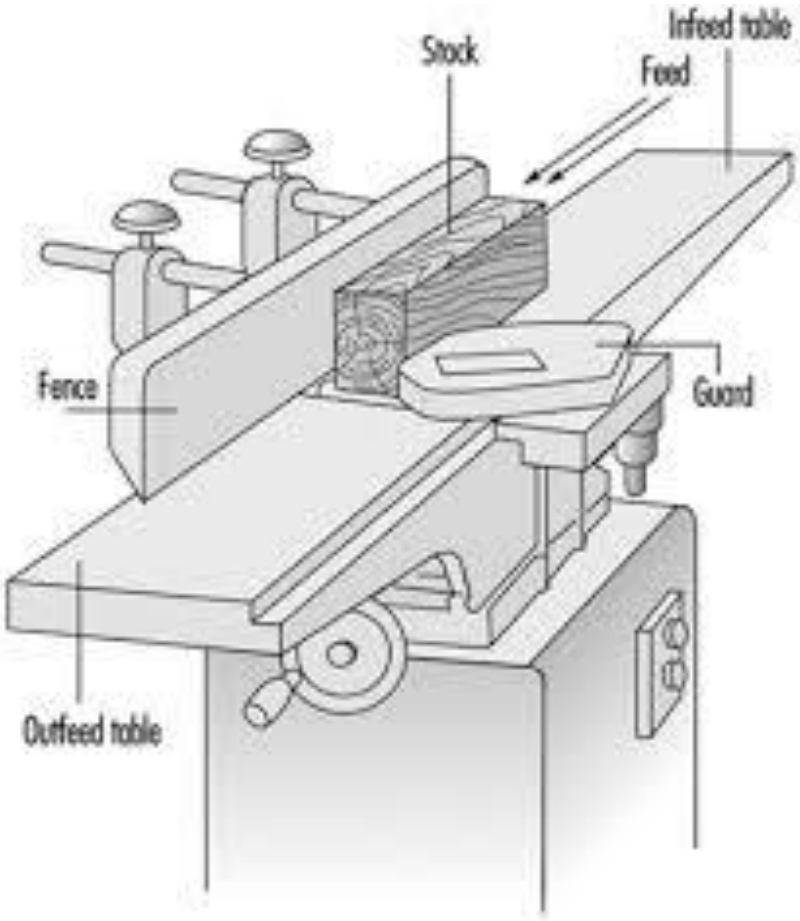
POTENTIAL HAZARDS AND INJURIES

- ⓘ Kickbacks
- ⓘ High Sound levels
- ⓘ Flying chips
- ⓘ Injury to workers nearby
- ⓘ Pinch, crush, and cut points
- ⓘ Contact with sharp objects
- ⓘ Electrical shock
- ⓘ Falling materials
- ⓘ Wood dust

DON'T

- ✘ Never pass hands over cutter head.
- ✘ Do not place thumbs at the end of the piece; use push block.
- ✘ Never run materials containing metallic objects like screws or nails.
- ✘ Do not joint-stock less than ¼" thick material.
- ✘ Do not joint material shorter than 10".
- ✘ Do not remove the guard.

Major Components of a Jointer



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BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Radial Arm Saw

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement the training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a radial arm saw the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the radial arm saw safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure all guards are secure and function properly.
- ✓ Ensure workspace has no hazards present.
- ✓ Start dust extraction unit before using the machine.

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Keep hands and fingers away from the blade.
- ✓ Ensure the saw blade reaches maximum speed before cutting.
- ✓ Check for bystanders before engaging the workpiece and place shields around the workpiece if needed.
- ✓ Avoid reaching over the saw line.
- ✓ When pulling the saw across, keep hands clear of the line of cut.
- ✓ Before adjusting the saw, please turn it off and make sure it comes to a stop.

ENDING OPERATIONS

- ✓ Turn off the saw and allow it to come to a complete stop.
- ✓ Shut blast gate and turn off dust collection.
- ✓ Clean up around the saw.
- ✓ Ensure all guards are in a fully closed position.
- ✓ Ensure the workplace is clean.

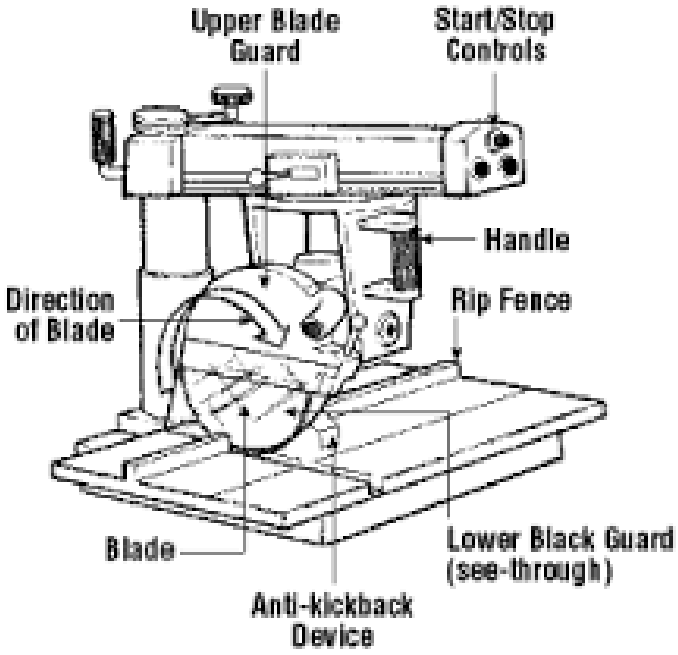
POTENTIAL HAZARDS AND INJURIES

- ⓘ Saw may kick back
- ⓘ Noise
- ⓘ Eye injuries
- ⓘ Flying chips
- ⓘ Injury to workers nearby
- ⓘ Dust
- ⓘ Contact with the rotating blade

DON'T

- ✘ Never saw without a workpiece against the fence.
- ✘ Never clear pieces from the workspace while the blade is moving.
- ✘ Never adjust the saw while the blade is running.
- ✘ Never cross arms.
- ✘ Never reach across the blade.
- ✘ Never remove the guard.
- ✘ Never cut more than one piece at a time.
- ✘ Never stand directly behind the blade.

Major Components of a Radial Arm Saw



Radial Arm Saw Accessories

There are many different types of accessories for radial arm saws. Below are a few of the common types of accessories used with radial arm saws. A laser mount is probably the most popular attachment for a radial arm saw. It creates a clear laser line to guide your cuts, ensuring you get an exact amount. Another popular attachment is a disk sander, which can turn your radial arm saw into a two-in-one machine with a power sander. Another accessory is a miter fence. You can attach the fence to the top of the table and allow the arm saw to slide along the fence, making angled cuts. The last accessory is a router. You can attach the router directly to the radial arm saw and fitted on the auxiliary blade.

Laser Mount

Disk Sander

Miter Fence

Routers

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Band Saw

DO NOT **use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Ensure the work area is clear of all obstacles that could result in injuries.
- ✓ Check that all the guards are in position and the blade is adjusted.
- ✓ Check to make sure the saw blade is sharp.
- ✓ Makes sure that you have the right saw and the correct speed is set for use.

OPERATION OF TOOL

- ✓ Keep fingers away from the blade when using.
- ✓ Ensure the upper and lower-wheel guard doors are closed when running.
- ✓ Never leave the machine on while away.
- ✓ Stop the saw immediately if you notice any problems.
- ✓ Use a push stick to push small pieces when cutting.
- ✓ Do not force anything while running the saw.
- ✓ Have a balanced stance while working the saw to prevent falling towards the saw.
- ✓ The blade alignment should be at the center of the wheels.

ENDING OPERATIONS

- ✓ When finished with the saw, turn off the saw and reset all guards to the fully closed position.
- ✓ Wait until the blade stops before doing anything else.
- ✓ Always let the blade stop on its own.
- ✓ Make sure to leave the saw in a safe and clean environment after completion.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of.
- ✓ Make sure to sweep the area.

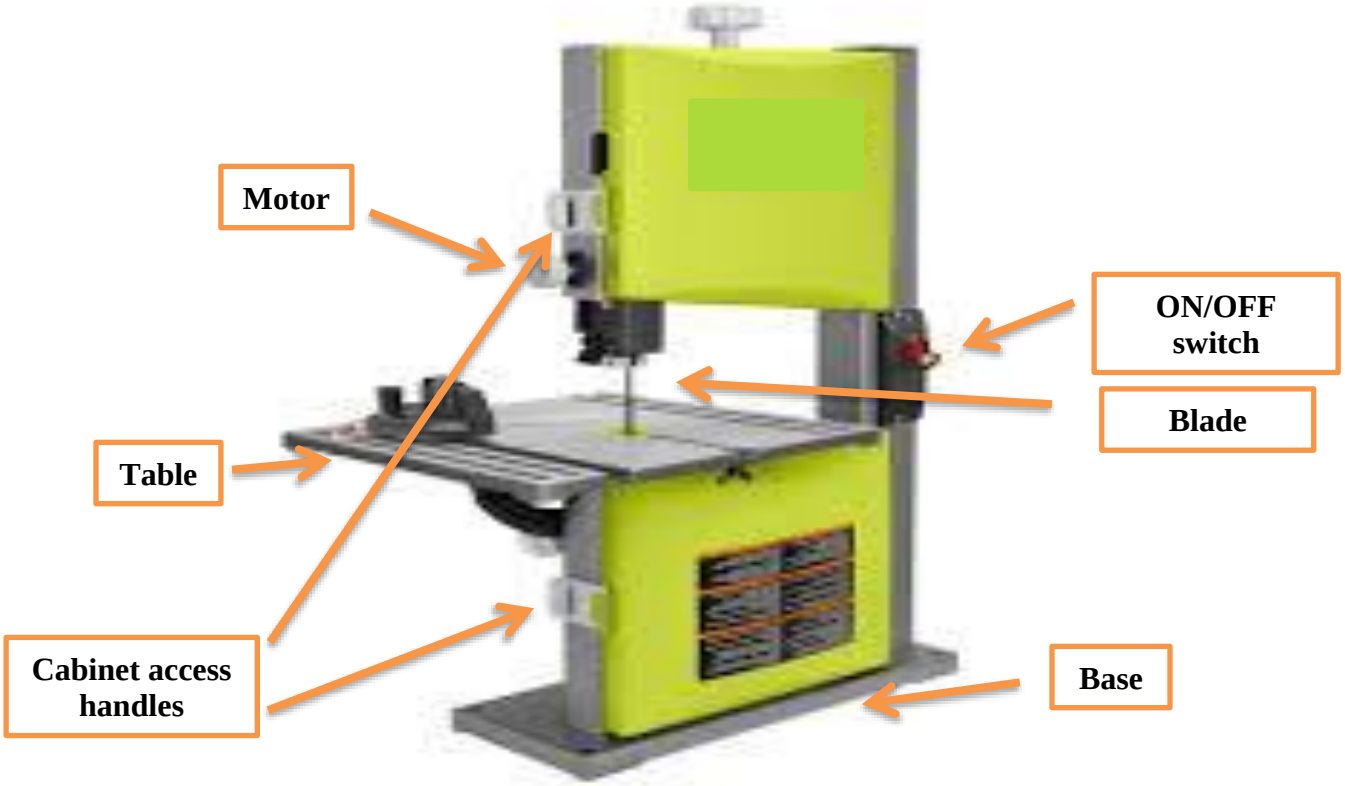
POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Cutting
- ⓘ Eye injuries
- ⓘ Dust
- ⓘ Contact with a rotating blade

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not attempt to cut small items.
- ✘ Do not cut cylindrical stock.
- ✘ Never leave saw running while not present.
- ✘ Do not force blade.

Major Components of a Band Saw



Band Saw Accessories

Other than the different brands and types of band saws, there are not many accessories that can be bought for your saw. However, an important accessory needed for a band saw is saw coolant. Saw coolant acts to cool the overall temperature of the band.

Band Saw Coolant:

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Planer

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Make sure you are familiar with the controls and types of operations.
- ✓ Make sure all guards are fitted perfectly.
- ✓ Check to make sure the work area is clean and that nothing could lead to injury.
- ✓ Set the depth of cut and lock the table into position to avoid any movement.
- ✓ Start the dust extraction unit before using the tool.

OPERATION OF TOOL

- ✓ Place boards with the concave side against the table.
- ✓ Plane with the direction of the grain.
- ✓ Stand to the side of the planer while using to prevent anything hitting you.
- ✓ Switch off the planer and make sure it is completely stopped before making any adjustments.
- ✓ If you see anything unusual, turn the machine off immediately.

ENDING OPERATIONS

- ✓ Switch off the machine and wait for it to stop completely.
- ✓ Reset the depth.
- ✓ Reset all the guards to the closed position.
- ✓ Store planer in a safe and clean environment.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of.
- ✓ Make sure to sweep the area.

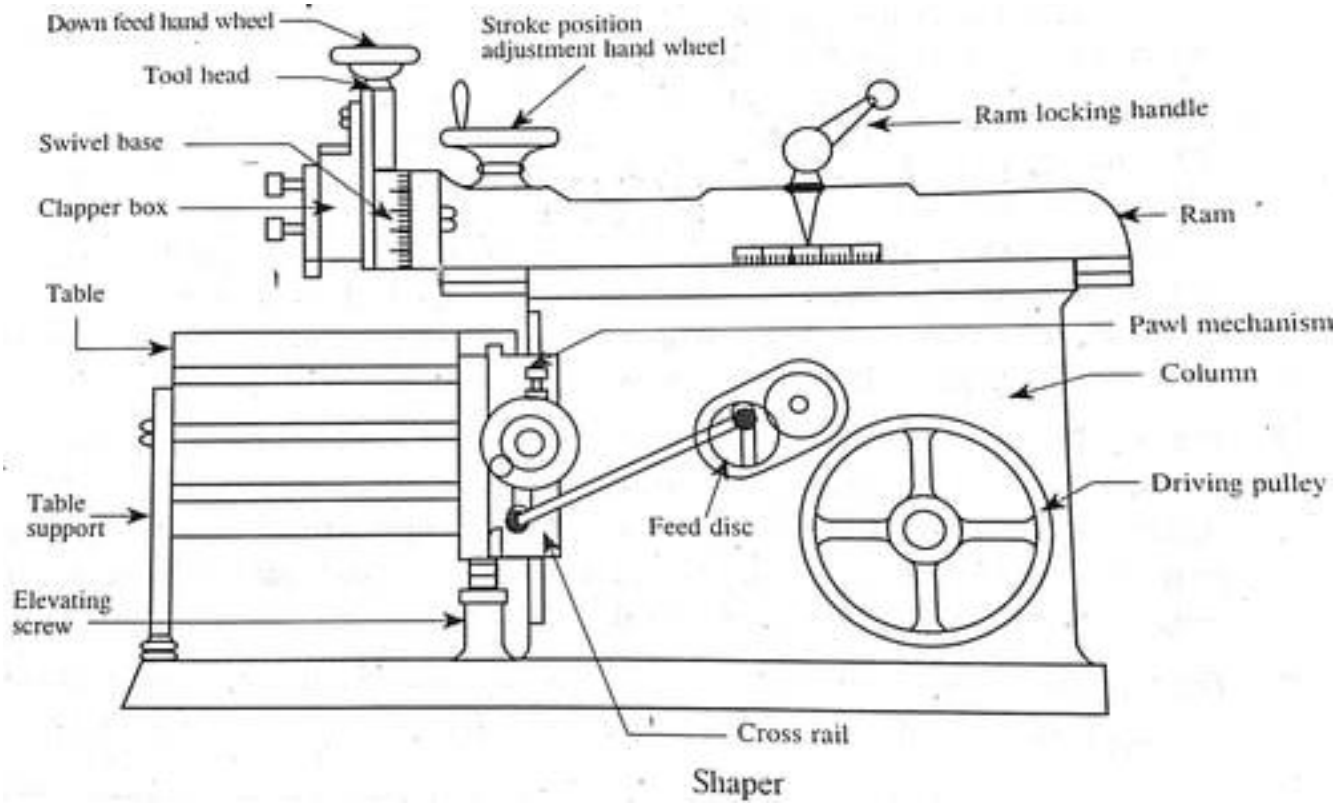
POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Cuts/ amputations
- ⓘ Kickbacks
- ⓘ Hearing damage
- ⓘ Eye injuries

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not plane stock with defects.
- ✘ Never leave the planer running unattended.
- ✘ Do not plane end grain.

Major Components of a Planer



Shaper

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BY CLEMSON® EXTENSION

Clemson Agricultural Safety Safe Operational Procedure (SOP)

Drill Press

DO NOT **use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure that you are familiar with all machine operations, specifically the ON/OFF starter and lockable E-Stop.
- ✓ Ensure all guards are fitted, secure, and functional. Do not operate if guards are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure long hair is tied back and loose clothing is pulled back or removed.
- ✓ Ensure the chuck key (if used) has been removed from the drill chuck.
- ✓ Follow correct clamping procedures to ensure work is secure.
- ✓ Select the correct style and diameter of drill or cutter for material and then adjust spindle needs.
- ✓ Ensure all drill table adjustment clamps are tightened securely.
- ✓ Faulty equipment must not be used. Immediately report suspect equipment.

OPERATION OF TOOL

- ✓ Never leave the machine running unattended.
- ✓ Before making adjustments or cleaning swarf accumulations, switch off and bring the machine to a complete standstill.
- ✓ Feed downwards at a sufficient rate to keep the drill cutting.
- ✓ Use lubricant on the stock when cutting metal stock to reduce friction.
- ✓ When using a drill press vice, ensure the handle of the vice is on the left-hand side when facing the front of the drill press
- ✓ Feed with care as the drill breaks through the underside of the work.
- ✓ Use a safe working posture.

ENDING OPERATIONS

- ✓ Switch off the machine when work is completed.
- ✓ Leave the machine in a safe, clean, and tidy space.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.

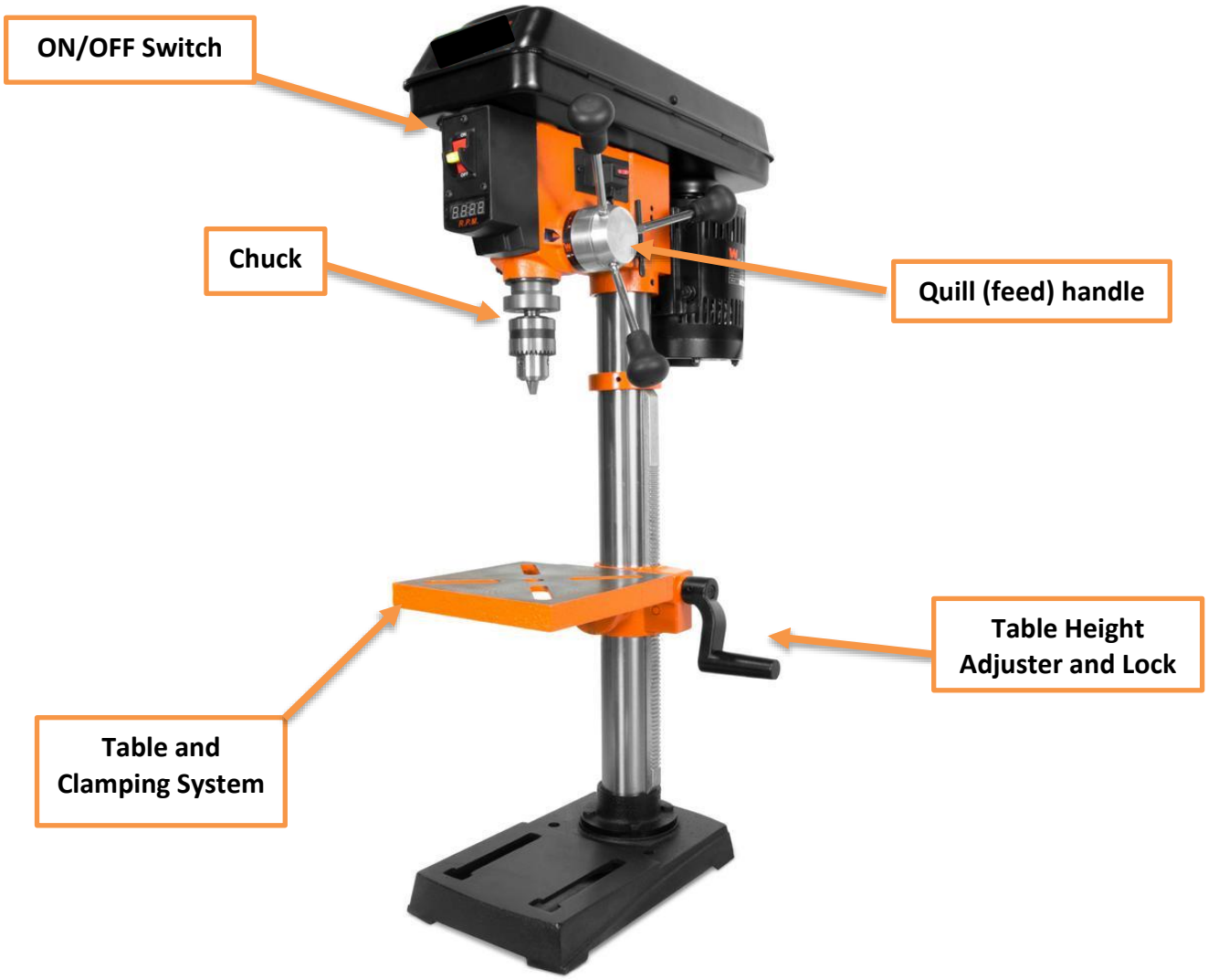
POTENTIAL HAZARDS AND INJURIES

- ⓘ Hair/clothing getting caught in moving machine parts
- ⓘ Eye injuries
- ⓘ Flying swarf and chips
- ⓘ High noise levels when drilling some materials
- ⓘ Sharp edges and burns

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never leave the machine running unattended.
- ✘ Do not use hold the item being drilled with your hands. Use a clamp.
- ✘ Never wear gloves while operating.

Major Components of a Drill Press



Drill Press Accessories

There are many different types of drill press accessories. Below are a few of the common types of accessories you may have when using a drill press. The drill press vice is one of the most important as it holds the material you will be working with. Magnetic clean-up tools can be used to remove fine metal particles from the workpiece or work area. Sanding drums allow you to sand the piece of material once finished; it easily attaches to your drill press.

Drill Press Vice

Magnetic Clean-up Tool

Sanding Drums

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety Safe Operational Procedure (SOP)

Stick/Arc Welder (SMAW)

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement the training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the operator is familiar with all operations and controls.
- ✓ Ensure the work area is clean and clear of any flammable materials.
- ✓ Make sure the required PPE are present and on, especially the head shield.
- ✓ Ensure welding equipment, work area, and gloves are dry to avoid electric shocks.
- ✓ Ensure cables are protected.
- ✓ Start fume extraction unit before beginning to weld.
- ✓ Ensure others that are near are protected from flashes.
- ✓ Ensure welding helmet has a minimum lense shade of 10*

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Ensure the electrode holder has no electrode in before turning on the welding machine.
- ✓ Use both hands when welding.
- ✓ Ensure good ventilation of the work area.
- ✓ Ensure cables make firm contact to provide a good connection.
- ✓ Do not let the electrode stick.
- ✓ Make sure the current is correctly set.
- ✓ Ensure no flammables are around when welding.
- ✓ Have pliers, tongs, or clamps at the ready to handle hot materials.

ENDING OPERATIONS

- ✓ Turn off the machine and fume extraction unit when finished.
- ✓ Dispose of electrode stubs properly.
- ✓ Turn off the power source.

CLEANING UP

- ✓ Store electrode holder, welding cables, and all other equipment in a safe and dry location.
- ✓ Leave the work area in a safe and clean state.

POTENTIAL HAZARDS AND INJURIES

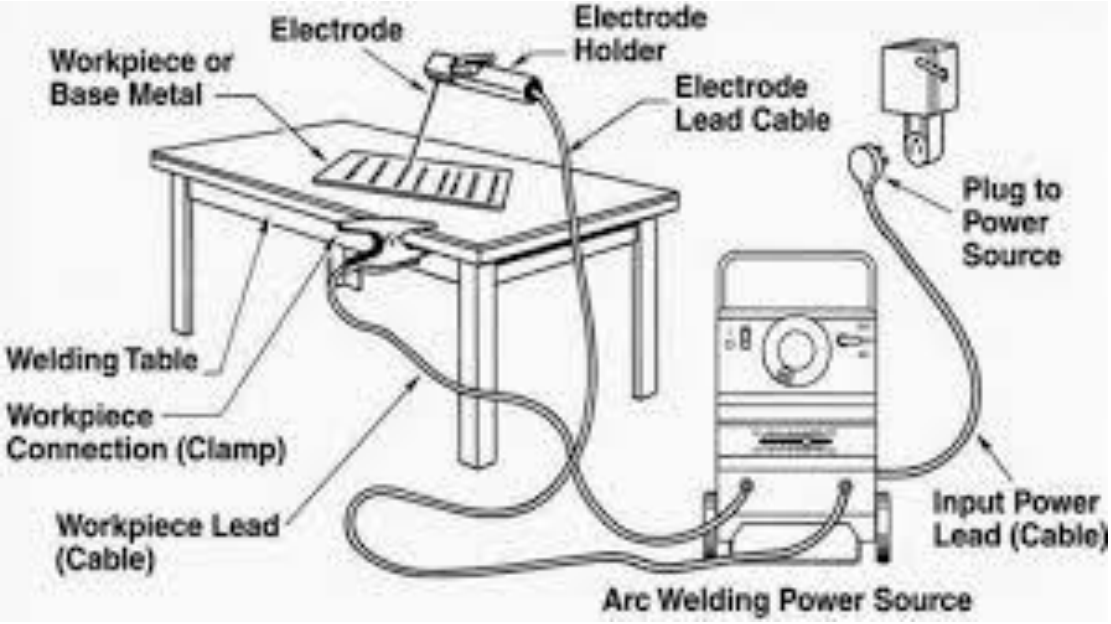
- ⓘ Flying sparks
- ⓘ Body burns due to hot materials
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Fumes
- ⓘ Radiation burns
- ⓘ Electrical shock

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never use tools with bare hands.
- ✘ Never use the tool one-handed.
- ✘ Never wrap electrode leads around yourself.
- ✘ Never use on or near flammable materials.

*If welding helmet darkness is adjustable, starter darker than #10 lense. If you can see, stay at the darker lens number. Shade lense number requirements can change based on the current needed for the material being welded.

Major Components of a Stick/Arc Welder



Stick/Arc Welder Accessories

Stick/arc welders only have a few types of accessories. Electrode holders and welding cables are accessories that you need to have when using a stick welder. Other accessories such as high heat gloves and head shields are also essential for safe use of the tool.

Electrode holder **High Heat Gloves** **Welding Cable Set** **Head Shield**

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
MIG Welder

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PERSONAL PROTECTIVE EQUIPMENT

PRE- OPERATIONAL SAFETY CHECKS

- ✓ Check workspace, walkways, and work leads to ensure no slip/trip hazards are present.
- ✓ Ensure the work area is clean and free of grease, oil, and any flammable material.
- ✓ Ensure equipment and work area is dry to avoid electrical shocks.
- ✓ Ensure that gloves, welding gun, and work leads are in good condition.
- ✓ Check gas cylinder and lines for any leaks or damage.
- ✓ Ensure the fume extractor unit is on before welding commences.
- ✓ Close the UV curtain or erect safety screens to ensure the protection of others.
- ✓ Do not use faulty equipment. Report immediately.
- ✓ Ensure welding helmet has a minimum lense shade of 10*

OPERATION OF TOOL

- ✓ Ensure the machine is correctly set up for current, voltage, wire feed, and gas flow.
- ✓ Ensure work return cables make firm contact to provide a good electrical connection.
- ✓ Never level welder running unattended.
- ✓ Avoid welding flashes—erect UV safety curtains as required.
- ✓ Regularly inspect the welding tip and shield for damage.
- ✓ Have pliers or tongs at the ready to handle hot materials.

ENDING OPERATIONS

- ✓ Switch off the machine and fume extraction.
- ✓ Close gas cylinder valve.
- ✓ Hang up the welding gun and welding cables.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.
- ✓ Leave the work area in a safe, clean, and tidy state.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Electric shock
- ⓘ Radiation burns to the eyes or body
- ⓘ Flying sparks
- ⓘ Fire
- ⓘ Fumes
- ⓘ The body burns due to hot or molten materials
- ⓘ Cuts and lacerations

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not leave running unattended.
- ✘ Never use on or near flammable materials.

*If welding helmet darkness is adjustable, starter darker than #10 lense. If you can see, stay at the darker lens number. Shade lense number requirements can change based on the current needed for the material being welded.

Major Components of a MIG Welder

MIG Welder Accessories

There are many different types of accessories for MIG welding, including an auto-darkening welding helmet, welding gloves, an angle grinder, and soapstone. Auto-darkening welding helmets allow you to start the weld on target. Welding gloves protect your hands from extreme heat. Angle grinders are helpful to prep surfaces and smooth welds. Lastly, soapstone makes marks on metal that are easy to see.

Auto-Darkening Helmet

Welding Gloves

Angle Grinder

Soapstone

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
TIG Welder

***DO NOT* use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Always wear proper PPE.
- ✓ Make sure there is enough room to move freely.
- ✓ Make sure that the area is clean of oil and anything flammable or harmful materials.
- ✓ Keep welding equipment and work area dry of any liquids.
- ✓ Make sure that all tools, such as the welding torch, are in good condition for use.
- ✓ Be sure to be located in a well-vented area.
- ✓ Make sure the work leads do not form a tripping hazard.
- ✓ Ensure welding helmet has a minimum lense shade of 10*

OPERATION OF TOOL

- ✓ Make sure that the TIG welder is correctly set up for current, voltage, and gas flow.
- ✓ Make sure the cables are firmly attached to provide a good connection.
- ✓ Strike the arc before placing the tip of the filler rod in the weld zone.
- ✓ Be sure to turn off the power to change tungsten electrodes.
- ✓ Do not leave the welder running unattended.
- ✓ Have pliers or tongs at the ready to handle hot materials.

ENDING OPERATIONS

- ✓ Switch off the machine as well as the fume extraction unit when done.
- ✓ Be sure to close the gas cylinder valve.
- ✓ Hang up the welding gun and all leads.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of.
- ✓ Make sure to sweep the area.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Fumes
- ⓘ Fire
- ⓘ Flying Sparks
- ⓘ Burns to body
- ⓘ Radiation burns to the eyes or body
- ⓘ Electric Shock

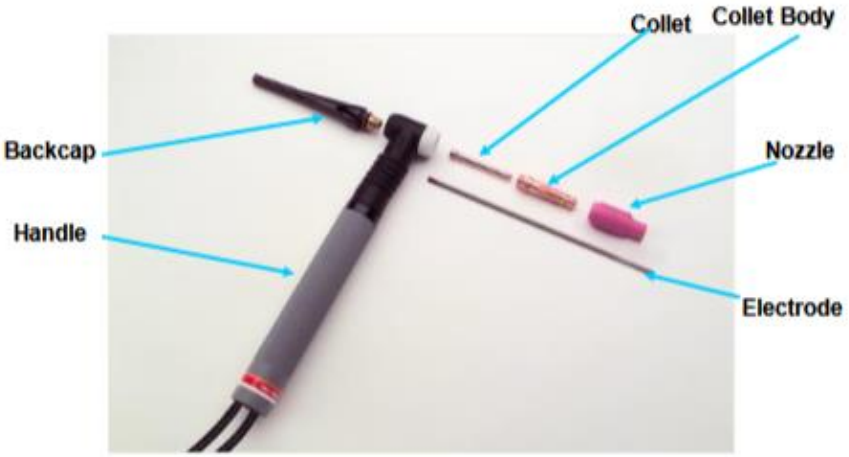
DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not send sparks in the direction of a bystander.
- ✘ Never use the tool one-handed.
- ✘ Never use on or near flammable materials.
- ✘ Do not weld without safety equipment.
- ✘ Do not weld in windy conditions (could lead to loss of coverage of shielding gas).

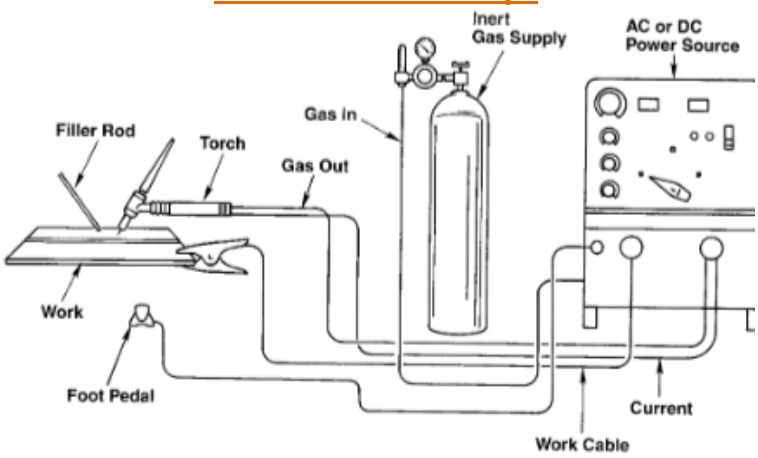
*If welding helmet darkness is adjustable, starter darker than #10 lense. If you can see, stay at the darker lens number. Shade lense number requirements can change based on the current needed for the material being welded.

Major Components of a TIG Welder

TIG Torch Assembly:



TIG Welder Setup:



TIG Welder Accessories

There are many different types of TIG welder accessories. There are separate nozzle tips, welding rods, and flow gauges and meters. Different nozzle tips change the amount of shielding gas the weld is exposed to. Various welding rods provide other metals and different uses. Flow gauges and meters can come in multiple sizes and shapes depending on what the user prefers.

Diamond Ground Monster TIG Torch:

Welding Rods:

Flow Gauges:

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Pneumatic Nail Gun

DO NOT **use this tool unless you have been instructed in its safe use and operation and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Ensure the task is understood.
- ✓ Ensure nails have been correctly loaded into the gun.
- ✓ The compressed air hose is in good condition and free from damage.
- ✓ Ensure the compressed air hose has been correctly attached to the gun.
- ✓ The workpiece is secured.
- ✓ Identify ON/OFF switch.

OPERATION OF TOOL

- ✓ Do not use nearby other workers.
- ✓ Set jigs to hold workpieces.
- ✓ Keep hands clear of the workpiece and away from the nail gun.
- ✓ Hold the gun to object to being nailed and hold steady when firing.
- ✓ Do not carry or re-position the gun with the trigger depressed.
- ✓ Place nail gun down before preparing next workpiece.

ENDING OPERATIONS

- ✓ Turn off the nail gun.
- ✓ Detach compressed air hose.
- ✓ Remove nails from the chamber.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.

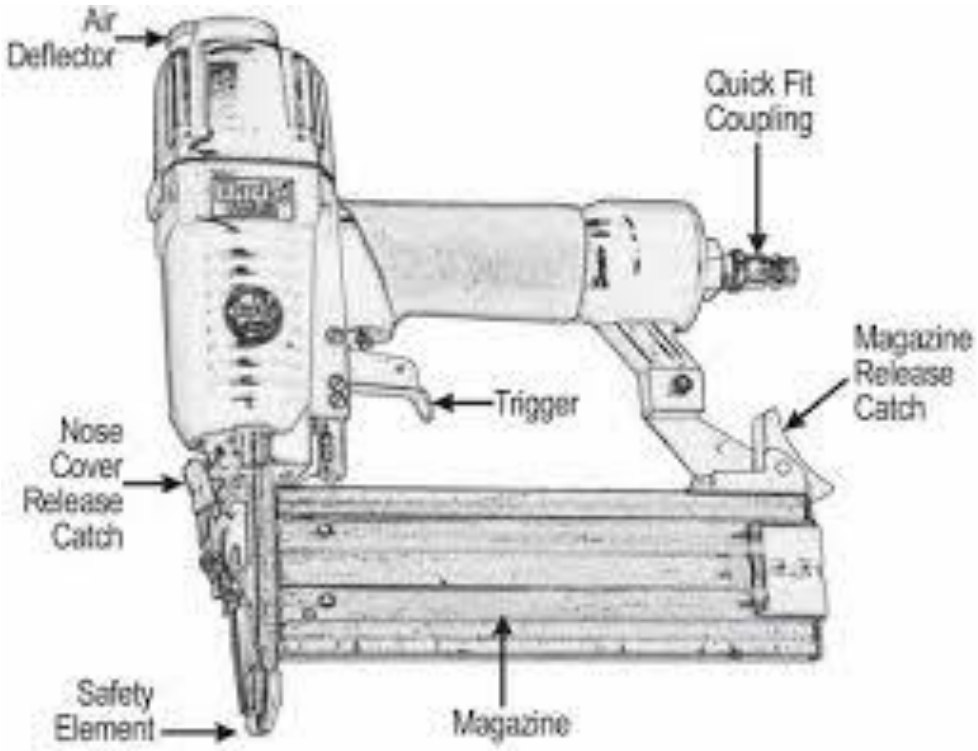
POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Loud Noise
- ⓘ Impact and cutting injuries
- ⓘ Slips, trips, and falls
- ⓘ Fire
- ⓘ Electrocution

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not use with people in immediate work areas.
- ✘ Do not carry or re-position when the trigger is depressed.

Major Components of a Pneumatic Nail Gun



Pneumatic Nail Gun Accessories

There are several different accessories for the pneumatic nail gun. A few accessaries include various types of nails, angled no-mar tip, no-mar work contact element, and a cleat conversion kit. Angled no-mar tips and no-mar work contact elements allow for protection for expensive woods. The cleat conversion kit will enable you to convert your nail gun to a cleat nailer.

Angled No-Mar Tip

No-Mar Work Contact Element

Cleat Conversion Kit

Notes

Gas Powered Tools

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Gas Powered Blower

***DO NOT* use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a gas-powered blower the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the power drill safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure the blower tube is free of foreign objects.
- ✓ **ON/OFF Switch:** Switch works properly and is free.
- ✓ **Choke:** Choke works properly and is free.
- ✓ **Primer bulb:** Bulb has no cracks, holes, or leaks.
- ✓ **Exhaust:** Has no blockages or foreign material present.
- ✓ **Fuel Tank:** The tank is free of foreign material, contains the appropriate fuel, and has no leaks.
- ✓ **Back straps (if present):** Straps have no cuts or tears; all connecting components are in good order; hardware is undamaged and secure.
- ✓ **Pull Cord:** The cord is undamaged and in working order; the spring still has tension and is intact.

OPERATION OF MACHINE

- ✓ Check for bystanders.
- ✓ Move ON/OFF switch to on, close choke, prime the fuel line, grasp pull cord handle firmly, and pull until tool starts, then place choke back in the open position.
- ✓ Ensure you have a good grip on the tool, and if straps are present, they are donned and tightened to fit the user.
- ✓ When blowing loose material, ensure no bystanders are present, and loose material is not blown into nearby structures that would cause the material to ricochet.
- ✓ If operating near a roadside, look up often to ensure no oncoming cars are present.

ENDING OPERATIONS

- ✓ Use the ON/OFF switch to turn off the tool.
- ✓ Put away in a safe location out of access to untrained persons and children.
- ✓ Ensure there are no leaks from the fuel tank or fuel lines after putting them away.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Vibration
- ⓘ Falling materials
- ⓘ Loss of balance due to the higher center of gravity and force from the blower
- ⓘ Electrical shock
- ⓘ Contact with sharp objects

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not use above or near flammable materials.
- ✘ Avoid using the tool one-handed if at all possible.
- ✘ Do not modify any of the switches on the tool.
- ✘ Do not operate without the appropriate hearing protection.
- ✘ Do not use a blower in the direction of a bystander.
- ✘ Do not place objects in the blower tube to purposely project them with the blower.
- ✘ Do not use a blower when on a roof or a ladder.

Major Components of a Gas-Powered Blower

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
String Trimmer

DO NOT **use this tool unless you have been instructed in its safe use and operation and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a string trimmer the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the power drill safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure the trimmer head is free of foreign material.
- ✓ **ON/OFF Switch:** Switch works properly and is free.
- ✓ **Choke:** Choke works properly and is free.
- ✓ **Primer bulb:** Has no cracks, holes, or leaks.
- ✓ **Exhaust:** Has no blockages or foreign material present.
- ✓ **Fuel Tank:** It is free of foreign material, contains the appropriate fuel, and has no leaks.
- ✓ **Handles:** Are free from cracks or structural damages.
- ✓ **Pull Cord:** The cord is undamaged and in working order; the spring still has tension.
- ✓ **Shaft:** Shaft is undamaged, not cracked or bent.
- ✓ **Guard:** Guard is present, undamaged, and not modified.

OPERATION OF MACHINE

- ✓ Check for bystanders.
- ✓ Move ON/OFF switch to on, close choke, prime the fuel line, grasp pull cord handle firmly, and pull until tool starts, then place choke back in the open position.
- ✓ Place tool on the ground when starting and ensure you have a good grip and proper form when pulling the cord.
- ✓ When operating near or on loose material, be sure to position the rotating head so any material projects away, not towards your body.
- ✓ If operating near a roadside, look up often to ensure no oncoming cars are present.

ENDING OPERATIONS

- ✓ Use ON/OFF switch to turn off the tool.
- ✓ Put away in a safe location out of access to untrained persons and children.
- ✓ Ensure there are no leaks from the fuel tank or fuel lines after putting them away.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Vibration
- ⓘ Electrical shock
- ⓘ Contact with sharp objects
- ⓘ Contact with spinning objects

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not use above or near flammable materials.
- ✘ Never use the tool one-handed.
- ✘ Do not modify any of the switches on the tool.
- ✘ Do not operate the tool without the appropriate hearing protection.
- ✘ Never operate a tool without eye protection.
- ✘ Cease operation when bystanders are nearby.
- ✘ Never remove the string guard.

String Trimmer Components

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Pressure Washer

***DO NOT* use this tool unless you have been instructed in its safe use and operation and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a pressure washer the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the pressure washer safely?
- ✓ Are the required PPE present and on?
- ✓ **ON/OFF Switch:** Switch works properly and is free.
- ✓ **Choke:** Choke works properly and is free.
- ✓ **Primer Bulb:** Bulb has no cracks, holes, or leaks.
- ✓ **Exhaust:** Has no blockages or foreign material present.
- ✓ **Fuel Tank:** The tank is free of foreign material, contains the appropriate fuel, and has no leaks.
- ✓ **Wand:** Is free from cracks, handle moves freely, and unbending.
- ✓ **Pull Cord:** The cord is undamaged and in working order; the spring still has tension.
- ✓ **Hose:** Hose is not dry rotted; has no cracks or leaks.
- ✓ **Fittings:** All fittings present; no leaks and no broken or bent fittings.

OPERATION OF MACHINE

- ✓ Check for bystanders.
- ✓ Connect the water hose to the pressure washer at the intake fitting, and squeeze the handle on the wand to allow water to fill the pump before starting the motor.
- ✓ Move ON/OFF switch to on, close choke, prime the fuel line, grasp pull cord handle firmly, and pull until tool starts, then place choke back in the open position.
- ✓ If operating near a roadside, look up often to ensure no oncoming cars are present.
- ✓ Move the stream of water constantly to prevent damage to objects and structures being washed.

ENDING OPERATIONS

- ✓ Use ON/OFF switch to turn off the tool.
- ✓ Put away in a safe location out of access to untrained persons and children.
- ✓ Ensure there are no leaks from the fuel tank or fuel lines after putting them away.
- ✓ Disconnect the hose and drain water from the pump and wand.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Vibration
- ⓘ Electrical shock
- ⓘ Contact with sharp objects
- ⓘ Contact with high-pressure water stream
- ⓘ Increased slips, trips, and fall potential
- ⓘ Exposure to chemicals

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never use equipment one-handed.
- ✘ Do not modify any of the switches on the tool.
- ✘ Do not operate the tool without the appropriate hearing protection.
- ✘ Never operate a tool without eye protection.
- ✘ Cease operation when bystanders are nearby.
- ✘ Never aim high-pressure water stream at a bystander.
- ✘ Never allow water to contact the skin or other body parts.

Pressure Washer Components

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Push-Type Mower

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a push mower the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the push mower safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure mower deck and discharge are free of foreign material.
- ✓ **Bail switch:** Switch works properly and is free; cable attached is taught when bail switch is engaged.
- ✓ **Choke:** Choke works properly and is free.
- ✓ **Primer bulb:** Has no cracks, holes, or leaks.
- ✓ **Exhaust:** Has no blockages or foreign material present.
- ✓ **Fuel Tank:** It is free of foreign material, contains the appropriate fuel, and has no leaks.
- ✓ **Handle:** Is free from cracks or structural damages; knobs move freely and are tight.
- ✓ **Pull Cord:** The cord is undamaged and in working order; the spring still has tension.
- ✓ **Discharge Guard:** Guard is present unless bagging chute or discharge chute is installed.
- ✓ **Blade(s):** Blade(s) is (are) undamaged, unbent, and in proper working order. Nut is tight, and blade(s) is (are) not loose.
- ✓ **Height Adjustment levers:** Levers are set to the proper height, move freely, and are undamaged.

OPERATION OF MACHINE

- ✓ Check for bystanders.
- ✓ Move ON/OFF switch to on, close choke, prime the fuel line, grasp pull cord handle firmly, and pull until tool starts, then place choke back in the open position.
- ✓ When operating near or on loose material, be sure to position the mower so that the discharge is away from bystanders, fragile objects, and the road.
- ✓ If operating near a roadside, look up often to ensure no oncoming cars are present.
- ✓ Mow with discharge pointing away from trees to prevent ricochet of projected materials from the mower.

ENDING OPERATIONS

- ✓ Disengage bail switch to turn mower off.
- ✓ Remove grass catch bag and empty contents.
- ✓ Put away in a safe location out of access to untrained persons and children.
- ✓ Ensure there are no leaks from the fuel tank or fuel lines after putting them away.
- ✓ Remove built-up material from deck to prevent premature degradation of the mower deck.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Vibration
- ⓘ Electrical shock
- ⓘ Contact with sharp objects
- ⓘ Contact with spinning objects
- ⓘ Contact with moving vehicles

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not use the tool above or near flammable materials.
- ✘ Never use the tool one-handed.
- ✘ Do not modify any of the switches on the tool.
- ✘ Do not operate without the appropriate hearing protection.
- ✘ Never operate without eye protection.
- ✘ Cease operation when bystanders are nearby.
- ✘ Never discharge material into a roadway.

Major Components of a Push Mower

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Oxygen-Acetylene Torch

***DO NOT* use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Check workspace to ensure there are no-slip or trip hazards.
- ✓ Check that the work area is free of flammable materials.
- ✓ Ensure gas hoses and regulators are in good condition and will not cause a trip hazard.
- ✓ Inspect all equipment for damage. Report any fault equipment immediately.
- ✓ Check for ventilation and ensure the fume extraction unit is on.
- ✓ Ensure equipment is fitted with an appropriate flash arrest system.
- ✓ Ensure glasses/helmets/goggles are a minimum of #4 shade lense

OPERATION OF TOOL

- ✓ When setting up, check the oxygen and acetylene regulator adjusting knobs are closed (off) and are loose.
- ✓ Ensure that both torch valves are closed.
- ✓ Ensure the use of the proper torch tip for the task; welding, heating, or cutting tips
- ✓ Slowly open cylinder valves on each gas cylinder by half a turn only.
- ✓ Screw in regulator adjusting knobs slowly until the delivery pressure gauges are both correct.
- ✓ Purge the oxygen gas line and check for constant gas flow. Re-adjust pressure if necessary.
- ✓ Open the acetylene torch valve very slightly and light with flint lighter ONLY.
- ✓ Continue to slowly open the acetylene torch valve until the correct flame length is produced.
- ✓ Slowly open the oxygen torch valve until a neutral flame is produced.
- ✓ Have pliers or tongs at the ready to handle hot materials.

ENDING OPERATIONS

- ✓ Close acetylene torch valve first.
- ✓ Close oxygen torch valve.
- ✓ Close both cylinder valves.
- ✓ Open oxygen torch valve to allow the gas to drain out.
- ✓ When the oxygen gauge reaches zero, unscrew the regulator-adjusting knob and close the oxygen torch valve.
- ✓ Turn off the acetylene/fuel cylinder valve.
- ✓ Open acetylene/fuel torch valve and release gas.
- ✓ When acetylene/fuel gauges read zero, then release regulator-adjusting knob.
- ✓ Close acetylene/fuel torch valve.

CLEANING UP

- ✓ Hang up welding torch and hoses.
- ✓ Clean torch tip to remove any material build-up
- ✓ Turn off fume extraction.
- ✓ Leave the work area in a safe, clean condition.

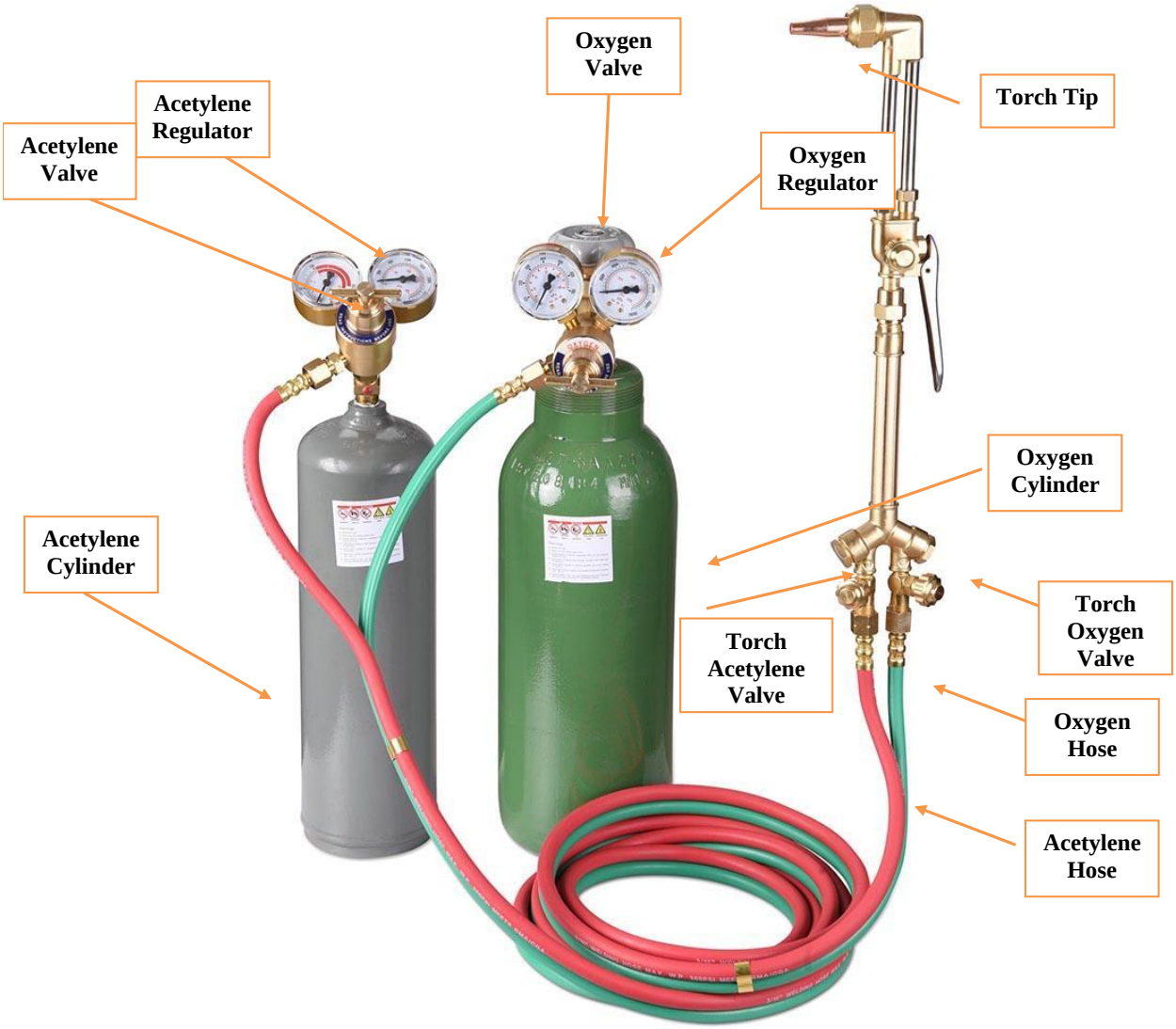
POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying sparks
- ⓘ Fumes and vapors
- ⓘ Flashbacks
- ⓘ IR radiation burns to eyes and skin
- ⓘ Fire
- ⓘ Explosion by a gas leak

DON'T

- ✘ Never light torch with matches or lighters.
- ✘ Never use oil, greases, or other hydrocarbons near oxy/acetylene gases.
- ✘ Do not send sparks in the direction of a bystander.
- ✘ Never turn acetylene past 15 PSI.
- ✘ Never turn cylinders on their side.

Major Components of an Oxygen-Acetylene Torch



Oxygen Acetylene Torch Accessories

There are several different oxygen-acetylene torch accessories. Below are a few of the common types. Flint Strikers are the most common and are used to light the torch. The cylinder caps will protect the cylinder valves in case of a fall.

Flint Striker

Cylinder Cap (Oxygen)

Cylinder Cap (Acetylene)

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Plasma Cutter

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a plasma cutter the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the plasma cutter safely?
- ✓ Are the required PPE present and on?
- ✓ Check workspace and make sure no hazards are present.
- ✓ Make sure the work area is clean.
- ✓ Check gloves and welding gun and ensure they are in good condition.
- ✓ Ensure the fume extractor unit is on before cutting.
- ✓ Make sure others are clear from flashes.
- ✓ Ensure glasses/helmets/goggles are a minimum of #4 shade lense

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Start fume extraction before beginning to cut.
- ✓ Ensure the machine is correctly set up for air/gas pressure and current.
- ✓ Ensure the return cables make firm contact.
- ✓ Engage the workpiece firmly and slowly.
- ✓ Never leave the plasma cutter unattended.
- ✓ Have pliers or tongs at the ready to handle hot materials.

ENDING OPERATIONS

- ✓ Ensure sufficient time for materials to cool.
- ✓ Turn off the machine and fume extraction.
- ✓ Turn off air/gas supply.

CLEANING UP

- ✓ Ensure that all loose materials created during the task are cleaned up and disposed of, and sweep the area.
- ✓ Put back plasma torch and hoses properly.
- ✓ Ensure the work area is safe and clean.

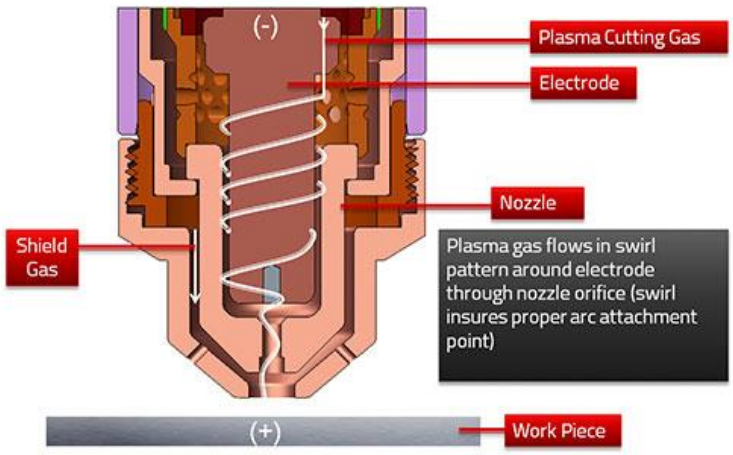
POTENTIAL HAZARDS AND INJURIES

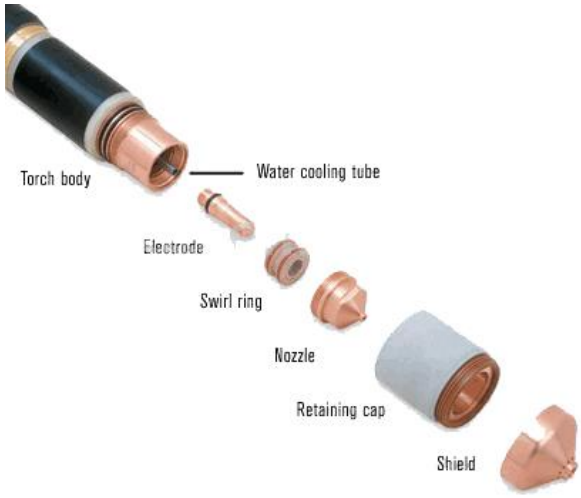
- ⓘ Electric shock
- ⓘ Noise
- ⓘ Compressed air
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Radiation burns
- ⓘ Body burns
- ⓘ Noxious gas
- ⓘ Fumes
- ⓘ Flying sparks

DON'T

- ✘ Do not use faulty equipment.
- ✘ Do not send sparks in the direction of a bystander.
- ✘ Do not wear rings and jewelry.
- ✘ Do not cut containers that have held combustible gases or liquid.
- ✘ Never leave the machine unattended.

Major Components of a Plasma Cutter



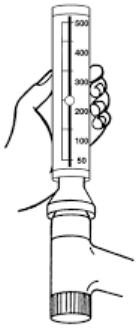


Plasma Cutter Accessories

There are many different types of plasma cutter accessories. Below are a few of the standard accessories used. An electrode carries the current from the plasma torch to the plate and is required to create an electric spark. A plasma flow measuring kit measures the amount of gas flow through the torch and is a great troubleshooting tool. The tip of the plasma torch holds the nozzle and is used for detailed cutting. The plasma torch regulates the plasma and is attached to the plasma cutter's end.

Electrode

Plasma Flow Measuring Kit



Nozzles

Plasma Torch

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Propane Torch

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Is a propane torch the appropriate tool for the task? Are there other tools better equipped for the task?
- ✓ Is the operator of the tool trained on how to operate the propane torch safely?
- ✓ Are the required PPE present and on?
- ✓ Ensure the work area is clean and clear of any flammable materials.
- ✓ Ensure the torch is operating correctly.
- ✓ Do not allow anybody else in the work area while operating.
- ✓ Ensure appropriate ventilation.
- ✓ Ensure cylinder valves are clean.
- ✓ Check connections for leaks.

OPERATION OF TOOL

- ✓ Ensure the workpiece is properly secured.
- ✓ Only use a spark lighter or electronic starter to light the torch.
- ✓ Keep torch flame away from the hose.
- ✓ Try to keep the hose free of kinks.
- ✓ Ensure all other workers stay at least 4 feet away from the torch.
- ✓ Set torch units in support leg position when not in use.

ENDING OPERATIONS

- ✓ When finished, close the cylinder valve first, let propane burn out, and close the torch valve.
- ✓ Disconnect hoses and store them properly.
- ✓ Monitor the work area after you finish to check for any signs of smoldering or hot spots.

CLEANING UP

- ✓ Ensure the workplace is cleaned thoroughly.

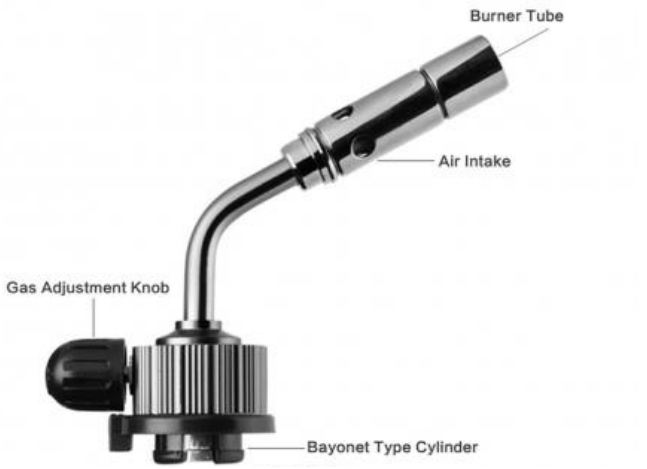
POTENTIAL HAZARDS AND INJURIES

- ⓘ Fire hazard
- ⓘ Contact with hot parts
- ⓘ Injury to workers nearby
- ⓘ Gas and fumes present
- ⓘ Burns
- ⓘ High temperatures

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never leave an operating torch unattended.
- ✘ Never use the tool one-handed.
- ✘ Never use on or near flammable materials.
- ✘ Never point the torch at anyone.
- ✘ Never use near combustible materials.
- ✘ Never operate without the proper PPE.

Major Components of a Propane Torch



Propane Torch Accessories

There are many accessories for propane torches. Strikers are used to light the flame of the propane torch. This flame can spread over a larger surface area with the flame spreader tip. Propane torches come with a variety of different tips that can be added to the torch. One of those tips is the pencil point tip. This tip is a very fine, small tip. These small tips can become stopped up with materials; that is where tip cleaners come in. Tip cleaners clean out the small holes in the propane torch's tips.

Notes

Agricultural Machinery

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Skid Steer

DO NOT **use this tool unless you have been instructed in its safe use and operation and have been given permission**

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PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Check all fluid levels.
- ✓ Check for leaks and structural damage to the machine.
- ✓ Ensure all appropriate PPE is present and on.
- ✓ Ensure implements are properly attached (lever arms down).
- ✓ Check machine's loader capacity rating.
- ✓ Enter machine using three points of contact.
- ✓ Adjust the seat to comfort and fasten the seat belt.
- ✓ Lower lap bar
- ✓ Check throttle position.
- ✓ Familiarize yourself with controls and movements.
- ✓ Always keep the body in the cab.
- ✓ Ensure the machine is in a neutral position before starting.
- ✓ Stay clear of moving parts when starting the machine.
- ✓ Check engine hours to ensure proper oil life.

OPERATION OF MACHINE

- ✓ Check for bystanders.
- ✓ Allow glow plugs to heat before starting.
- ✓ Carry loads as low as possible.
- ✓ Be conscientious of tipping points.
- ✓ Drive slow enough to keep control over unexpected hazards and do not stop suddenly or make sudden movements.
- ✓ Travel up/down slopes rather than across, taking extra care when ascending or descending steep slopes.
- ✓ Take care when refueling to avoid spilling fuel onto a hot motor or exhaust.
- ✓ Never carry passengers in/on the loader.
- ✓ Be aware of all overhead and underground hazards (powerlines, gas lines, water lines). Call 811 before digging.
- ✓ Watch for pedestrians and be mindful of blind spots.

ENDING OPERATIONS

- ✓ Park on even ground.
- ✓ Lower implement and place level on the ground.
- ✓ Stop the engine.
- ✓ Apply the parking brake.
- ✓ Move controls to release pressure from hydraulic lines.
- ✓ Check interlock system.

CLEANING UP

- ✓ Remove foreign material from around the engine.
- ✓ Keep the work area or implement the shed in a safe, clean, and tidy condition.

POTENTIAL HAZARDS AND INJURIES

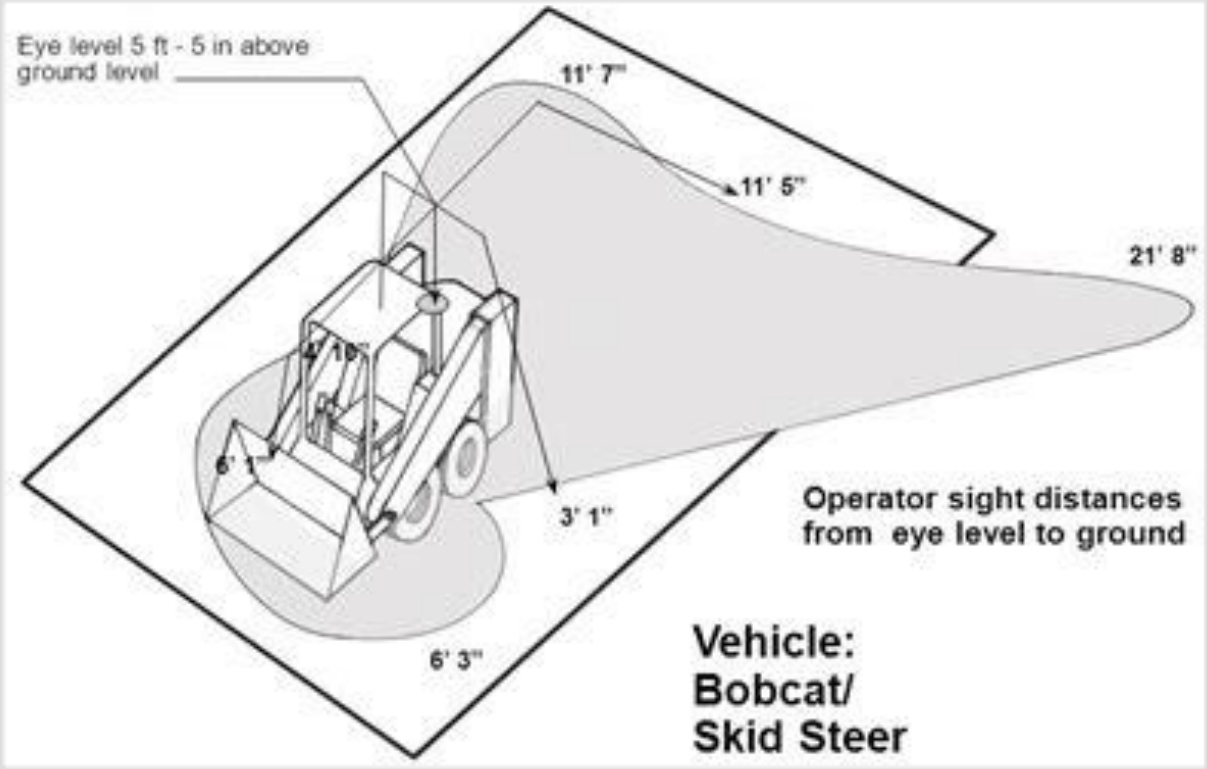
- ⓘ Flying objects
- ⓘ Broken or damaged hydraulic lines
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Falling material from loader
- ⓘ Contact with hot parts
- ⓘ Rollovers and boom: Crush related traumatic injuries
- ⓘ Fire from dry material contact with the exhaust
- ⓘ Ejection from seat
- ⓘ Contact with cars if a near roadway
- ⓘ Pinch, crush, cut points

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never carry passengers.
- ✘ Do not modify ROPS.
- ✘ Never reach into the blower unit when the engine is running.
- ✘ Never exit machine with boom overhead.

Major Components of a Skid Steer

Equipment Blind Spot



Daily Pre-Operational Checklist: Skid Steer

Operator: _____ Date: _____ Skid Steer ID: _____
Make/Model: _____ Location:_____

Item	Ok	Needs Attention	Specific Comments
Tires: • Properly inflated • No visible damage • Free of punctures • Valve stem cap present			
Cab and Side Screen: • No frame damage • No unauthorized alterations • Side screen attached properly • No damage to side screen			
Safety Belt and ROPS • Seatbelt present and undamaged • ROPS deployed and pins present • The structural integrity of ROPS (welds, bolts, etc.)			
Grab Handles • Non-slip grip undamaged • No structural damages (welds)			
Steps: • Free from dirt, clutter, snow, ice, etc. • Non-slip surface intact and undamaged			
Attachments front and/or rear • Attached correctly • Fastened securely • Structurally sound (welds) • Hydraulic lines undamaged			
Fluid Leaks • No signs of hydraulic leaks • No signs of fuel leaks • Fluid levels adequate			

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Zero Turn Ride-On Mower

***DO NOT* use this tool unless you have been instructed in its safe use and operation and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Check all fluid levels.
- ✓ Locate and become familiar with all machine operations and controls.
- ✓ Ensure all guards are fitted, secure, and functional. Do not operate if guards are missing or faulty.
- ✓ Ensure that the seat belt is in sound condition.
- ✓ Ensure cutting blades are sharp, secure, and in good condition.
- ✓ Ensure any pneumatic and hydraulic mechanisms are in sound condition.
- ✓ Ensure all electrical switches (including dead man's switch if fitted) are functioning.
- ✓ Adjust the seat to comfort and secure the seat belt.

OPERATION OF MACHINE

- ✓ Check for bystanders.
- ✓ Be sure the transmission is out of gear and the mower blade clutch disengaged before starting.
- ✓ Keep clear of moving machine parts.
- ✓ Drive at a speed slow enough to keep control over unexpected hazards.
- ✓ Travel up/down slopes rather than across, taking extra care when ascending or descending steep slopes.
- ✓ Take care when refueling to avoid spilling fuel onto a hot motor or exhaust.
- ✓ Before making adjustments, bring the machine to a complete standstill and isolate it.
- ✓ Watch for ejected material. Ensure no person or animal is endangered when operating equipment.

ENDING OPERATIONS

- ✓ Park on even ground.
- ✓ Stop mower and shift the gear selector to park position.
- ✓ Raise and secure the cutting blades.
- ✓ Lock the parking brake.
- ✓ Stop the engine and remove the keys.

CLEANING UP

- ✓ Remove foreign material from around the engine, blades, and mowing deck.
- ✓ Keep the work area or implement the shed in a safe, clean, and tidy condition.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Flying objects
- ⓘ Rapidly rotating cutting blades
- ⓘ Noise at or above 85 decibels
- ⓘ Eye injuries
- ⓘ Ejected material and flying debris
- ⓘ Contact with hot parts
- ⓘ Rollovers: Crush related traumatic injuries
- ⓘ Fire from dry material contact with the exhaust
- ⓘ Ejection from seat
- ⓘ Contact with cars if a near roadway

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never carry passengers.
- ✘ Do not wear a seatbelt if ROPS has been lowered.
- ✘ Do not modify ROPS.
- ✘ Never mow slope or hill greater than 15 degrees.
- ✘ Never mow without the discharge chute in the operating position.
- ✘ Never bypass safety switches.
- ✘ Never discharge material into a roadway. Grass clippings can be slick and can cause two-wheeled vehicles to lose traction and wreck.

Major Components of a Zero-Turn Ride-On Mower

Zero Turn Ride-On Mower Accessories

There are many different accessories for Zero Turn Ride-On Mowers. Below are a few accessories that can range anywhere from bags to front-end loaders to various lawn implements.

Daily Pre-Operational Checklist: Zero-Turn Ride-On Lawn Mower

Operator: _____ Date: _____Mower ID: _____
Make/Model: _____ Location:_____

Item	Ok	Needs Attention	Specific Comments
Tires: • **Properly inflated** • **No visible damage (cracking, dry rot, etc.)** • **Proper tread levels** • **Free of punctures** • **Valve stem cap present**			
Operator Station and Platform: • **No frame damage** • **No unauthorized alterations** • **Platform free of obstructions** • **All levers free from obstructions** • **All control levers/buttons undamaged and functioning (throttle, PTO, 4WD, etc.)** • **No damage to non-slip surfaces** • **Forward and reverse pedals free from obstruction** • **Handles free from obstruction and foreign material**			
Safety Belt, ROPS, and Lights: • **Seatbelt present and undamaged** • **ROPS deployed and pins present** • **The structural integrity of ROPS (welds, bolts, etc.)** • **Ensure all lights are functioning** • **Ensure slow moving vehicle reflector is present, undamaged, and visible**			
Mower Deck: • **Foreign material removed** • **Blades are sharp and undamaged** • **Bolts are tight on blades** • **All pulleys adequately greased** • **The structural integrity of the deck** • **Belts are free of damage or cracking** • **The blower (if equipped) is undamaged, and the internal fan is undamaged; unobstructed** • **Discharge chute free of blockages and shield is in place and undamaged**			
Engine: • **Fluid levels adequate** • **No leaks** • **Air filter clean and free of debris** • **Exhaust free from debris** • **Wiring harnesses intact and undamaged**			
Area Around Machine: • **Site free of obstructions before starting** • **No pedestrians within proximity**			

S

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Hydrostatic Tractor

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Adorn all appropriate PPE.
- ✓ Check all fluid levels.
- ✓ Check for leaks and structural damage to the machine.
- ✓ Ensure implements are properly attached (lever arms down).
- ✓ Enter machine using three points of contact.
- ✓ Adjust the seat to comfort and fasten the seat belt.
- ✓ Check throttle position.
- ✓ Familiarize yourself with controls and movements.
- ✓ Check machine's loader capacity rating (if equipped).
- ✓ Check engine hours to ensure proper oil life.
- ✓ Lock brakes together if traveling.
- ✓ Ensure slow-moving vehicle signage is present and visible.

OPERATION OF MACHINE

- ✓ Check for bystanders.
- ✓ Keep body within the platform.
- ✓ Allow glow plugs to heat before starting.
- ✓ Ensure the machine is in a neutral position before starting and PTO is disengaged, and the clutch is depressed if present.
- ✓ Set range to the desired position with the clutch depressed if present.
- ✓ Depress left foot pedal for forwarding motion, suitable for reverse.
- ✓ Carry loads as low as possible (if loader equipped).
- ✓ Be conscientious of tipping points.
- ✓ Drive slow enough to keep control over unexpected hazards and do not stop suddenly or make sudden movements.
- ✓ Travel up/down slopes rather than across, taking extra care when ascending or descending steep slopes.
- ✓ Take care when refueling to avoid spilling fuel onto a hot motor or exhaust.
- ✓ Never carry passengers.

ENDING OPERATIONS

- ✓ Park on even ground.
- ✓ Lower implement and place level on the ground.
- ✓ Put range to the neutral position.
- ✓ Stop the engine.
- ✓ Apply the parking brake.
- ✓ Move controls to ensure the machine is stable and remove pressure from hydraulic lines.

CLEANING UP

- ✓ Remove foreign material from around the engine.
- ✓ Keep the work area or implement the shed in a safe, clean, and tidy condition.

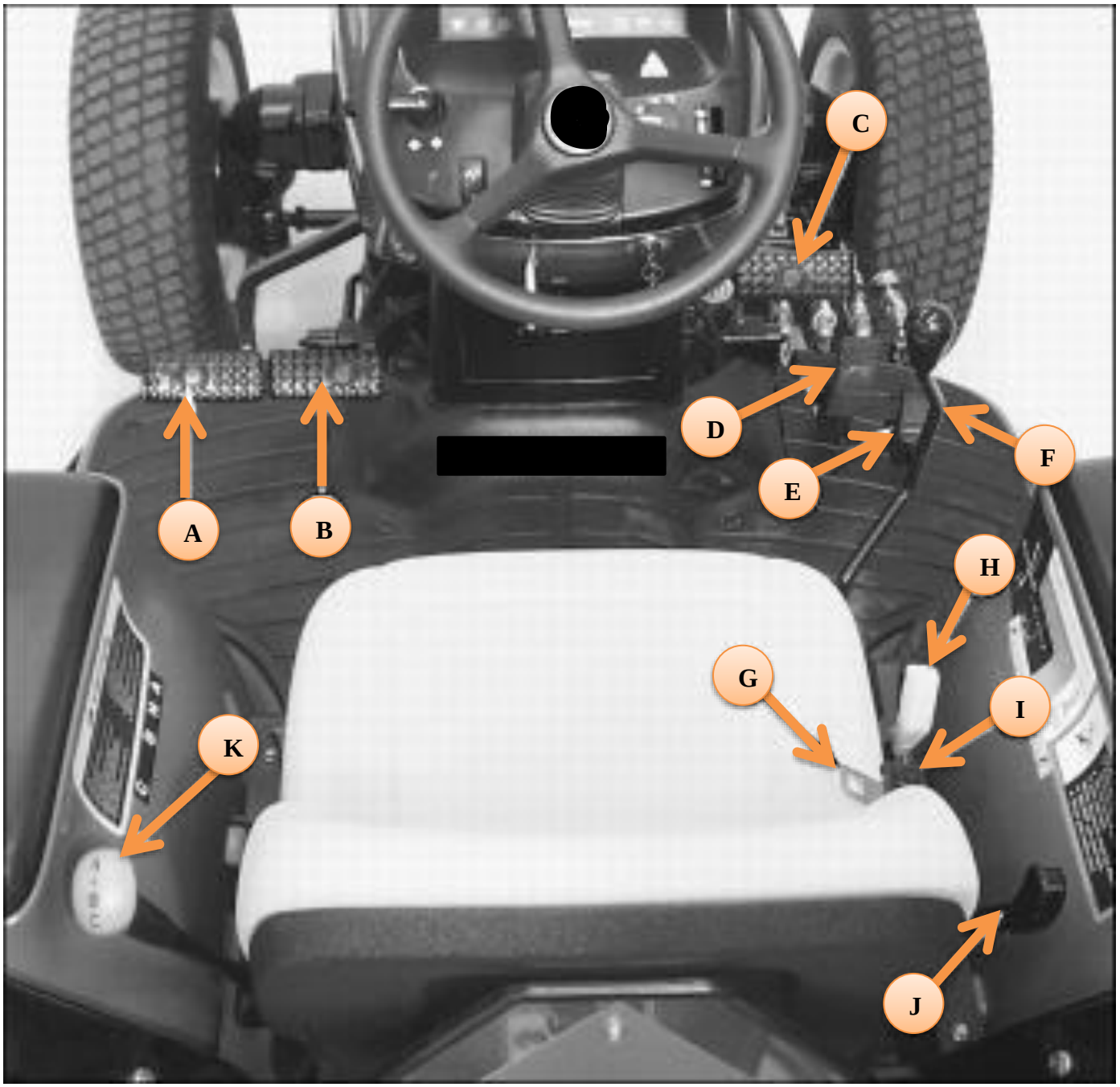
POTENTIAL HAZARDS AND INJURIES

- ⓘ Broken or damaged hydraulic lines
- ⓘ Noise.
- ⓘ Eye injuries.
- ⓘ Falling material from loader
- ⓘ Contact with hot parts.
- ⓘ Rollovers and boom: Crush-related traumatic injuries.
- ⓘ Fire from dry material contact with the exhaust
- ⓘ Ejection from seat
- ⓘ Contact with cars if a near roadway
- ⓘ Pinch, crush, cut points

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never carry passengers.
- ✘ Do not modify ROPS.
- ✘ Never exit machine with boom overhead.

Major Components of a Hydrostatic Tractor



A. Left Brake
B. Right Brake
C. Clutch
D. Forward Directional Pedal
E. Reverse Directional Pedal
F. Front-end Loader lever
G. Seatbelt
H. PTO Lever
I. Three-Point Hitch Height Control
J. Three-point Hitch Lever

All components shown here are the significant components typically found on a mid-sized utility tractor. Note that not all tractors are set up the same, nor are the configurations and placement of the levers are the same. It is essential that whenever you get on a tractor that you are unfamiliar with, you take a moment to learn all the controls before operating the tractor.

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Gear-Drive Tractor

DO NOT use this tool unless you have been instructed in its safe use and operation and have been given permission

This SOP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

PERSONAL PROTECTIVE EQUIPMENT

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Adorn all appropriate PPE.
- ✓ Check all fluid levels.
- ✓ Check for leaks and structural damage to the machine.
- ✓ Ensure implements are properly attached (lever arms down).
- ✓ Enter machine using three points of contact.
- ✓ Adjust the seat to comfort and fasten the seat belt.
- ✓ Check the throttle position.
- ✓ Familiarize yourself with controls and movements.
- ✓ Check machine's loader capacity rating (if equipped).
- ✓ Check engine hours to ensure proper oil life.
- ✓ Lock brakes together if traveling.
- ✓ Ensure slow-moving vehicle signage is present and visible.

OPERATION OF MACHINE

- ✓ Check for bystanders.
- ✓ Keep body within the platform.
- ✓ Allow glow plugs to heat before starting.
- ✓ Ensure the machine is in the neutral position, PTO is disengaged, and the clutch is depressed.
- ✓ Set range and gear levers to the correct position for the task at hand.
- ✓ Slowly and fully release the clutch and allow the tractor to move.
- ✓ If the tractor is equipped with a hydraulic shuttle, use a shuttle lever instead of a clutch to set the tractor in motion.
- ✓ Carry loads as low as possible (if loader equipped).
- ✓ Be conscientious of tipping points.
- ✓ Drive slow enough to keep control over unexpected hazards and do not stop suddenly or make sudden movements.
- ✓ Travel up/down slopes rather than across, taking extra care when ascending or descending steep slopes.
- ✓ Take care when refueling to avoid spilling fuel onto a hot motor or exhaust.
- ✓ Never carry passengers.

ENDING OPERATIONS

- ✓ Depress clutch or move shuttle lever to neutral position and apply brakes.
- ✓ Park on even ground.
- ✓ Lower implement and place level on the ground.
- ✓ Set range and gear levers to neutral (shuttle lever if equipped).
- ✓ Apply the parking brake.
- ✓ Stop the engine.
- ✓ Move controls to ensure the machine is stable and remove pressure from hydraulic lines.

CLEANING UP

- ✓ Remove foreign material from around the engine.
- ✓ Keep the work area or implement the shed in a safe, clean, and tidy condition.

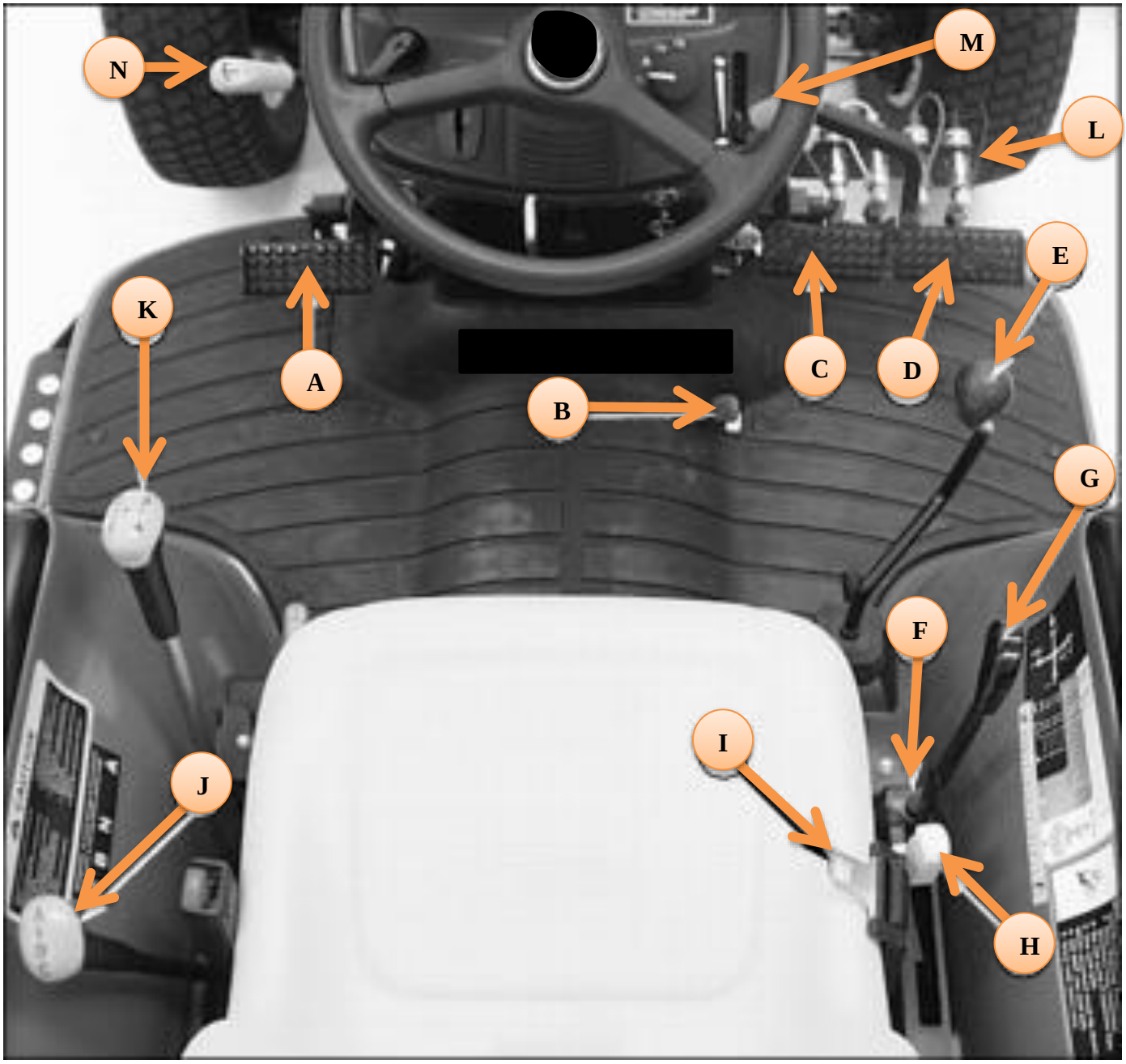
POTENTIAL HAZARDS AND INJURIES

- ⓘ Broken or damaged hydraulic lines
- ⓘ Noise.
- ⓘ Eye injuries.
- ⓘ Falling material from loader
- ⓘ Contact with hot parts.
- ⓘ Rollovers and boom: Crush-related traumatic injuries.
- ⓘ Fire from dry material contact with the exhaust
- ⓘ Ejection from seat
- ⓘ Contact with cars if a near roadway
- ⓘ Pinch, crush, cut points

DON'T

- ✘ Do not use faulty equipment.
- ✘ Never carry passengers.
- ✘ Do not modify ROPS.
- ✘ Never exit machine with boom overhead.

Major Components of a Gear-Drive Tractor



A. Clutch
B. Foot Throttle
C. Left Brake
D. Right Brake
E. Front-end Loader Control Lever
F. Three-Point Hitch Height Setting
G. Three-Point Hitch Lever
H. PTO Lever
I. Seat Belt
J. Range Lever
K. Gear Select Lever
L. Hydraulic Quick Connects for Front-end Loader
M. Throttle
N. Hydraulic Shuttle

All components shown here are the significant components typically found on a mid-sized utility tractor. Note that not all tractors are set up the same, nor are the configurations and placement of the levers are the same. It is essential that whenever you get on a tractor that you are unfamiliar with, you take a moment to learn all the controls before operating the tractor.

Daily Pre-Operational Checklist: Gear Drive/Hydrostatic Tractor

Operator: _____ Date: _____Tractor ID: _____

Make/Model: _____ Location:_____

Item	Ok	Needs Attention	Specific Comments
Tires: • **Properly inflated** • **No visible damage (cracking, dry rot, etc.)** • **Proper tread levels** • **Free of punctures** • **Valve stem cap present**			
Operator Station and Platform: • **No frame damage** • **No unauthorized alterations** • **Platform free of obstructions** • **All levers free from obstructions** • **All control levers/buttons undamaged and functioning (throttle, PTO, 4WD, etc.)** • **No damage to non-slip surfaces** • **Forward and reverse pedals free from obstruction**			
Safety Belt, ROPS, and Lights: • **Seatbelt present and undamaged** • **ROPS deployed and pins present** • **The structural integrity of ROPS (welds, bolts, etc.)** • **Ensure all lights are functioning** • **Ensure slow moving vehicle reflector is present, undamaged, and visible**			
PTO and 3 Pt. Hitch: • **Foreign material removed** • **PTO shaft undamaged and shield in place** • **All pins in place on 3 Pt. Hitch arms** • **3 Pt. Hitch arms structurally sound** • **Top link undamaged and greased** • **All grease points adequately lubricated**			
Engine: • **Fluid levels adequate** • **No leaks** • **Air filter clean and free of debris** • **Exhaust free from debris** • **Wiring harnesses intact and undamaged**			
Area Around Machine: • **Site free of obstructions before starting** • **No pedestrians within proximity** • **Overhead powerlines located**			

Notes

Electrical Hazards and Safety

Overview

Electrical systems in the agriculture industry must follow their guidelines to help prevent injury and damage to personal property. These guidelines can range from the height of overhead lines to special wires meant to withstand moist or damp conditions, or finally, to the requirement of ground-fault circuit interrupters (GFCI). All these safety precautions are put in place to protect the operator and those directly related to the agriculture work.

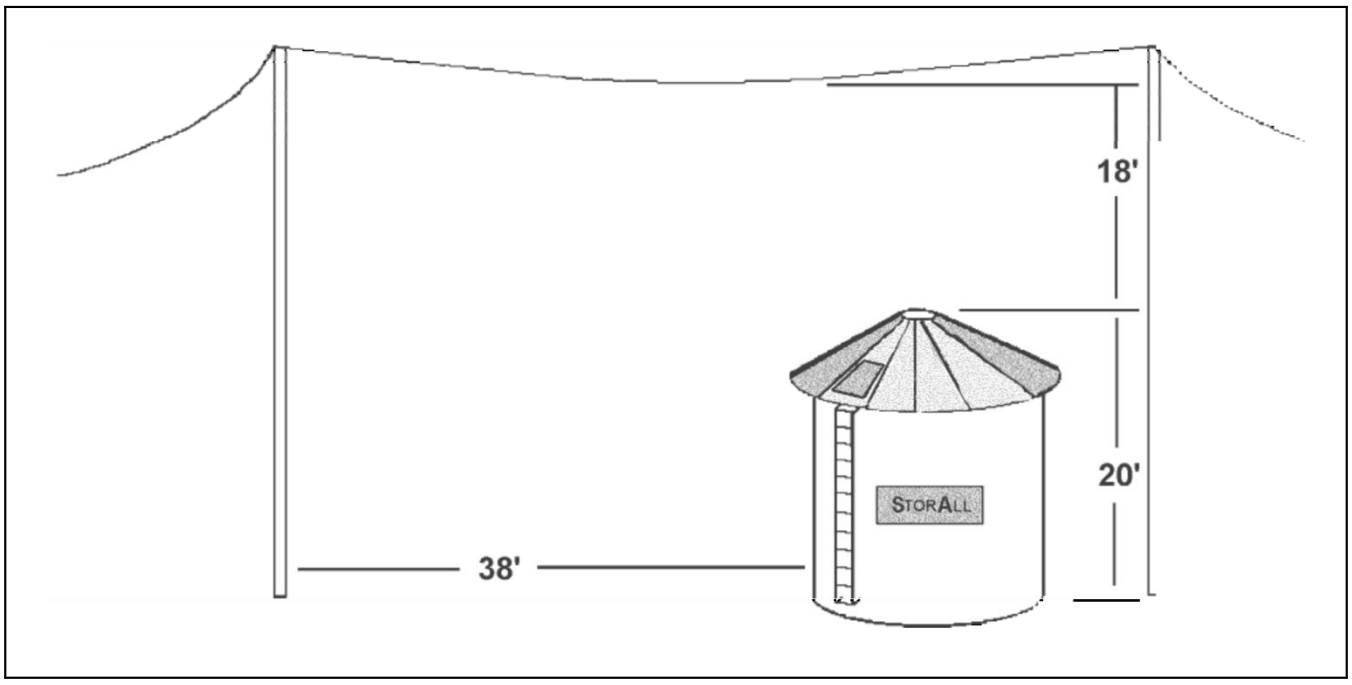
Overhead Lines

Overhead lines often present an issue when grain augers, bale elevators, and other tall equipment are moved before them being lowered. Many injuries caused by overhead lines could be avoided if the lines were raised or the equipment is lowered before the operator begins to move it.

Placement of Overhead Lines

National guidelines are used to determine the placement of overhead power lines. The National Electrical Safety Code (NESC) and the National Electric Code (NEC) are used to determine these measurements. The two sets differ in the source of the primary electrical current. The NESC standards address electrical supply equipment wires ahead of the transformer location that provides power to the farm or agricultural operation. In contrast, the NEC standards address the electrical wiring from the meter to the specific electrical device.

To NESC standards, for portable auger systems, the height of the overhead line must be at least 18 feet above the tallest point on the grain bin. The NESC standards also state the post must be a minimum of 38 feet from the bin on the loading side of a grain bin.



For fixed grain-handling systems, the NESC standards require the overhead lines that serve the transformer must be at least 12.5 feet above the structure's roof. These lines must not be able to be easily accessed by people. If the top of a bin is easily accessible, then the minimum height of the overhead lines must be at least 18 feet above the highest point.

For roadways or paths that any agricultural equipment travel, the NESC standards require the overhead lines to be a minimum of 18.5 feet above the ground. These requirements ensure that neither tractor nor implement can come in contact with the overhead lines.

The NEC standard requires an eight-foot minimum clearance from any rooflines that are easily accessible and an 18-foot clearance above roadways that any agricultural equipment travel.

Wiring Agricultural Facilities

There are various methods to provide electricity to agricultural operations, and only a few can be discussed in this notebook. However, if more questions arise or need additional information, always contact your local electrical inspector, electrician, or electrical supplier.

Non-metallic Sheathed Cable

Typically, agricultural structures are damp due to the lack of environmental controls. Because of this, “Type NMC” or “UF” cable is recommended for these more wet environments. These cables are recommended for these locations because they lack a layer of paper installation and can stay damp without becoming corroded. The gauge of the cable needed varies with the length of run and the power demand of its connected equipment.

Table 1: Current Capacity of Certain Cables*

	Conductor Size (AWG No.)		Maximum Allowable Amps
Cable Type	Copper	Aluminum	Fuse Size
NMC,UF	#14	#12	15
	#12	#10	20
	#10	#8	30

* There are many exceptions to this table; therefore, check with a qualified electrican before purchasing or instaling cable.

Protecting Electric Cable

Electric cables can be placed inside conduit to provide extra protection from livestock, rodents, and general wear. The two most basic types of conduit are metal and PVC (plastic). PVC is generally preferred in agricultural-related facilities and structures because it is resistant to corrosion by moisture. PVC is also typically less expensive than metal conduit. Electric cables should be placed in open areas where they can easily be inspected. Switches and all other electrical devices should be placed out of the reach of livestock, if possible.

Ground-Fault Circuit Interrupters (GFCI)

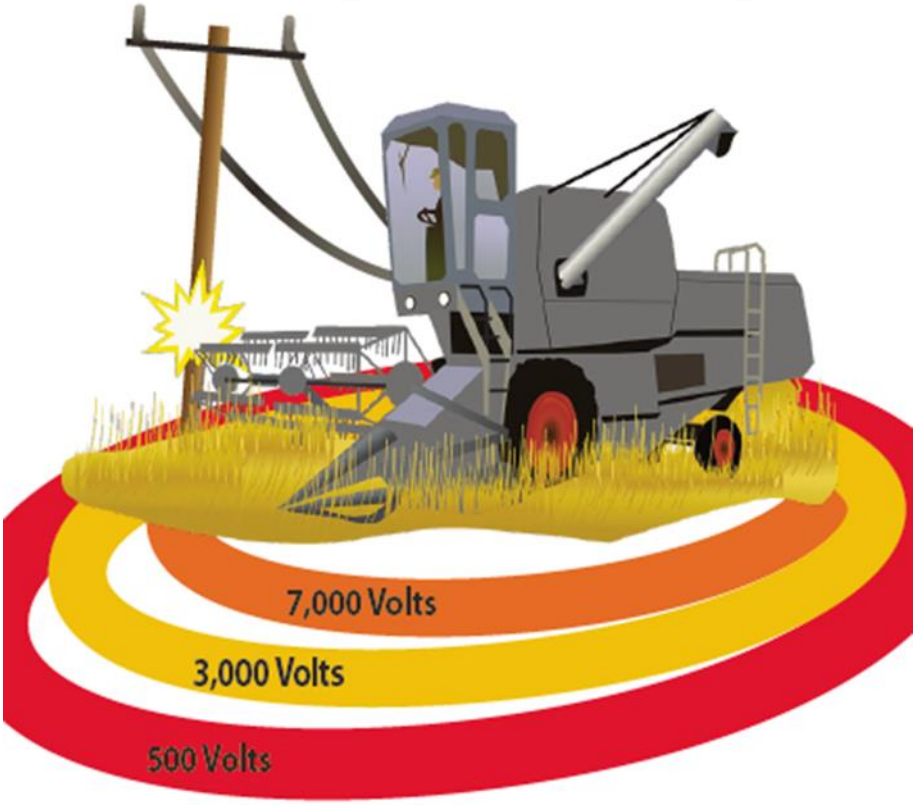
A ground-fault circuit interrupter (GFCI) is a circuit breaker designed to prevent shock to people or animals in wet or damp conditions. When a circuit is working correctly, two wires supply a single phase, and both cables must carry the same amount of current. If a ground fault happens, whether through the grounding wire or a body, some of the current takes a different path back to the circuit. When this occurs, one of the wires will have less current running through it, resulting in the GFCI breaking the circuit. When the circuit is broken, the flow of electricity stops to prevent electric shock. Any equipment plugged into a GFCI protected receptacle will have ground-fault protection.

Extension Cords Use Checklist

- Do not use in wet areas.
- Do not try and repair a damaged extension cord. Replace the cord.
- Keep cords away from sharp objects, heat, oil, and other solvents that could damage the insulation.
- Always check the extension cord for damage before use.
- Do not overload extension cords.

Step Potential

If the equipment you are in hits a utility pole, the surrounding area can become energized.



- **STEP POTENTIAL** is voltage between the span of one step.
- Voltage is highest at the source and fades as the energy moves across the ground.
- Stepping on two different voltages at the same time may electrocute you.
- If you see a downed line, the safest place is inside the cab or on the equipment.

Notes

Safe Load Securement

Safe Load Fact Sheet

DESCRIPTION

The objective is to provide basic information regarding safe load and proper hauling procedures for equipment transport.

TIEDOWN CONSTRUCTION AND MAINTENANCE

The tiedown must be constructed so the driver can tighten it. All components of tiedown must be in correct working order.

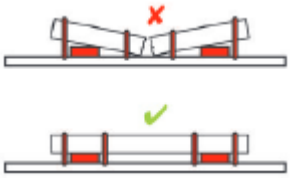
- No knots
- No obvious damage
- No weakened parts or sections

CHOOSING THE CORRECT SECUREMENT SYSTEM

The securement system must be appropriate for the cargo's size, weight, and shape.

Tiedown Placement

If a spacer is utilized, the tiedown should be placed as close as possible to the spacer.
The tiedown should also be placed symmetrically over the length of the cargo.

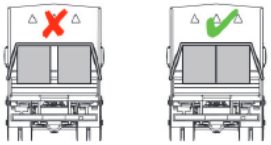


Working Load Limit (WLL)

The Working Load Limit is the maximum load applied to the securement system under normal use (this is determined by the component's manufacturer, as shown in the figure below).

Securing Bundles

Place in direct contact and provide blocking to prevent bundles from shifting towards one another.



Transporting Light Trucks to Heavy Machinery

When transporting any machine, first set the parking brake.

10,000 lbs. or less

Use at least two tiedowns at both front and rear.

More than 10,000 lbs.

Restrain cargo using a minimum of four tiedowns, each with a WLL of at least 5,000 lbs. This will help prevent cargo movement in the side-to-side, forward, rearward, and vertical directions. Lower and secure all accessories (booms, loader, shovel, etc.)

Common Securement Equipment

1-inch ratchet strap to be used with a small lawnmower, ATV or building supplies less than 400 lbs.

2-inch ratchet strap to be used with UTV, hay, or building supplies less than 2,000 lbs.

Ratchet chain binder to be used with light trucks to heavy machinery. Easy to tighten and loosen as needed and will not self-loosen.

Lever action binder not to be used on highway loads, difficult to tighten and loosen. THE HANDLE MUST BE SAFELY TIED DOWN; IF NOT PROPERLY SECURED, IT MAY SELF-LOOSEN.

Grain Bin and Silo Safety

****This literature is only meant to be informative on hazards associated with grain bins and is not intended to certify or permit any persons from entering into bins or working on or near grain bins and their associated structures and equipment****

Overview:

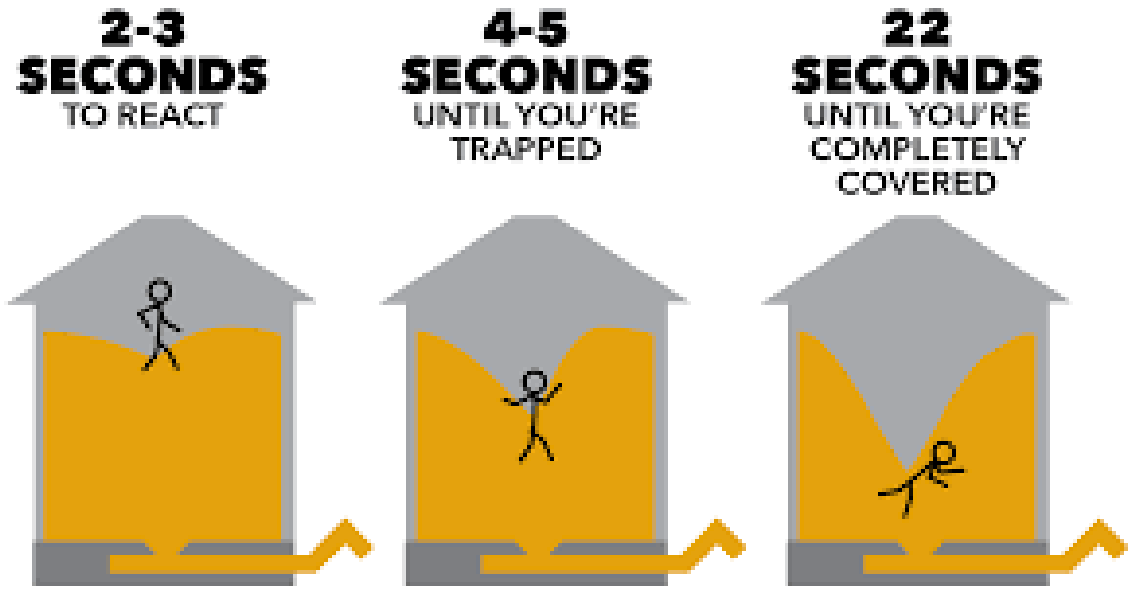
Grain bins are storage structures for harvested grain such as corn, soybeans, wheat, milo, canola, and more. Many different hazards are associated with grain bins. These hazards need to be monitored and respected so all who work with and around these facilities go home safe at the end of the day. The following sections will cover some of the most prominent hazards associated with grain storage facilities. They will help identify and avoid injury or death when working in or around these areas.

Grain Entrapment and Engulfment:

Every year, people who work with and around grain bins become entrapped or engulfed within the bin.

Entrapment: When a person has sunk low enough into the grain that they are unable to escape the grain without assistance from another person.

Engulfment: When a person has sunk low enough that their head is below the grain.



On average, a person has about **2-3 seconds** to react before they have sunk too far to release themselves from the grain.

Causes of Grain Entrapment and Engulfment:

Flowing Grain: Moving grain acts much like quicksand in how it moves. When removed from a bin, grain moves in a conical motion and can trap a person quickly.

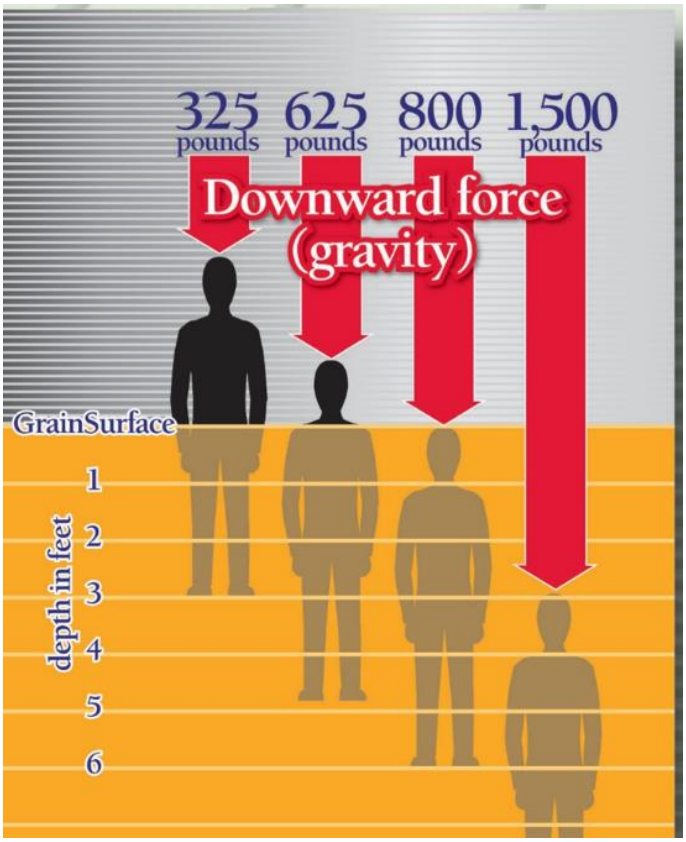
Grain Bridging: Grain bridging occurs when wet grain molds and forms a crust on the surface of the grain pile. When the grain has been pulled from underneath the crusted grain, a cavity can form below. This will result in a "bridge" of crusted grain suspended above the cavity. Many instances have occurred where a worker has entered a bin on top of the bridged grain, and the grain has collapsed, leaving the worker engulfed.

Grain Wall Collapse: Grain wall collapse occurs when wet grain molds and sticks together along the grain bin walls. This forms a barrier of grain that has the potential to collapse. Many instances can occur when a worker entered a bin to knock down a grain wall, and the wall fell on the worker, leaving them engulfed.

****NEVER ENTER A BIN YOU SUSPECT TO HAVE BRIDGED GRAIN OR A GRAIN WALL****

What kind of forces does it take to remove a person entrapped in grain?

Once a person has become entrapped in grain, the downward forces on the person's body increase beyond the point of just pulling them out. Once a person becomes completely submerged below the surface of the grain, the forces on the human body are so great that the entrapped person can no longer just be pulled out without risking severe injury.



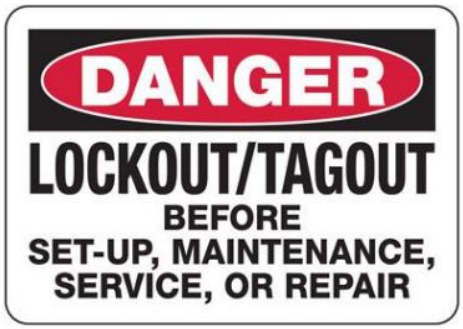
Tips for avoiding grain entrapment or engulfment:

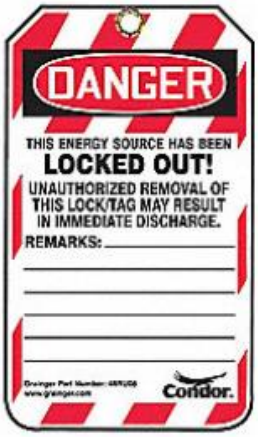
1. **Target Zero Entry:** Avoid having to enter a bin at all costs.
    a. Improperly stored grain has a higher chance of molding and crusting, leading to situations where a person must enter a bin. Take steps to ensure the grain going into a bin is not too wet and the grain in storage does not remain in storage for too long.

    b. Grain bins are often marked with several different types of signs indicating the dangers that could be present.

2. Lockout/Tagout

a. Implement a Lockout/Tagout Program for your operation to ensure all equipment associated with adding or removing grain from the bin has been shut off and cannot be turned on while a person is in the bin.





3. Never Go in Alone

a. Always have a bin attendant with you to ensure that someone on the outside of the bin can see and hear you in the event of an emergency.

b. Always have at least three people involved when a bin entry is occurring:

   i. Bin entrant: The person who enters the bin and dons the appropriate PPE for bin entry.

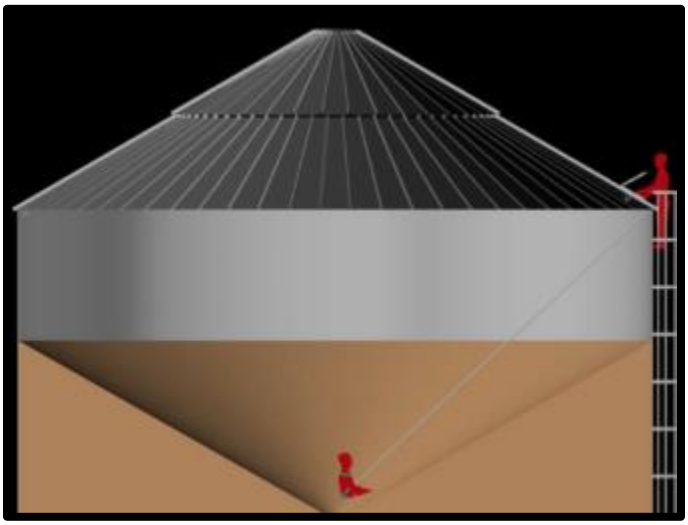
   ii. Bin Attendant: The person who keeps eyes on and always maintains contact with the bin entrant. He/she is wearing the same PPE the entrant is wearing in case of an emergency.

   iii. Outside communicator: The person who keeps contact with the attendant who can alert the appropriate persons in an emergency.

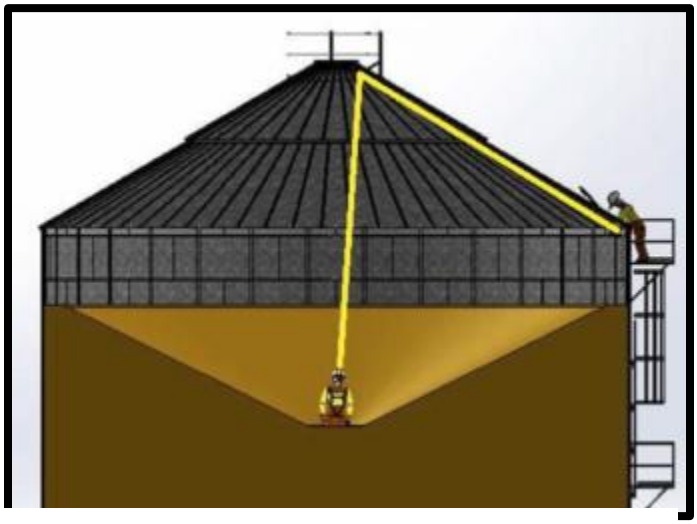
4. Harness and Anchor Points

a. Ensure to have on all appropriate Personal Protective Equipment (PPE) when entering a bin, including a harness with a lanyard attached. In an emergency, such as a person standing in moving grain, a harness and lanyard may be the only factor preventing the person from sinking below the grain surface.

b. Several companies and bin manufacturers today offer retrofitting kits, such as wall anchor mounting systems, to accompany bin entry kits. Wall anchoring can allow a bin entrant and the bin attendant to control the amount of permitted slack in the entrant's rope. This is done so that the bin entrant cannot sink further than their knees in the case of flowing grain.



This is an inadequate way for a safety rope to be connected. The person outside of the bin has no leverage and is not tied off to a proper anchorage point.



This is an adequate way for a safety rope to be connected. The person outside of the bin has the help of a pulley in the center of the bin at an anchorage point to help hold the weight of the bin entrant.

Notice in the right-hand image, there is a bin entrant tied off using a ceiling anchor. There is also a bin attendant keeping constant communication with the entrant.

Do NOT use as anchoring points:	Identification
• Ladder rungs • Handrails • Air ducts • Electrical conduit • Water lines • Any other items in the immediate area not intended to be load-bearing	- Color coding anchoring points can make them easier to identify them hurry. - Use red paint to paint mainline anchor points. - Use blue paint to identify belay line anchor points.

Concrete anchor plate developed by Edon Farmers Cooperative and Scott Equity Exhcange, in conjunction with SATRA. Anchor plate is color-coded red for main line or blue for belay line.

Personal Protective Equipment (PPE) for Entering a Bin:

Wearing the appropriate PPE when entering a bin can mean the difference between life and death. The following PPE is recommended for bin entrants and attendants.

1. **Full body harness**
    a. A full-body harness connected to an anchor point can prevent a person from sinking into flowing grain. The harness can also be a vital part of rescue during an emergency. The OSHA website provides the following information:

Harness Inspection – Guidelines

Tagging System

Every harness must have a legible tag identifying the harness, model, date of manufacture, name of manufacturer, limitations and warnings.

- ✖ Check tag for date of manufacture and remove from service if past adopted service life policy
- ✖ If tagging system is missing or not legible remove harness from service.

Cleaning and Storage

Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and mild detergent. Work up a thick lather, with a vigorous back and forth motion. Then wipe dry with a clean cloth.

Hang freely to dry, but away from excessive heat, steam or long periods of sunlight.

Storage areas should be clean, dry and free of exposure to fumes, heat, direct ultra violet light, sunlight and corrosive elements.

Note: Do not store harnesses next to batteries, chemical attack can occur if battery leaks.

Harness Inspection Guidelines

Webbing

Grasp the webbing with your hands and bend the webbing, checking both sides. This creates surface tension making damaged fibers or cuts easier to see. Webbing damage may not show up through a sight (visual) inspection only – manual (touch) the harness is equally important.

Visual and Touch Inspection	✓ Pass ✖ Fail Criteria
✖ Cuts, nicks or tears	
✖ Broken fibers/cracks	
✖ Overall deterioration	
✖ Modifications by user	
✖ Fraying/Abrasions	
✖✓ Discoloration of material	Dependant on cause of discoloration
✖ Hard or shiny spots	Indicates heat damage
✖ Webbing thickness uneven	Indicates possible fall
✓ Mildew	Clean harness
✖ Missing Straps	
✖ Undue Stretching	Indicates possible fall
✖ Burnt, charred or melted fibers	Indicates heat damage
✖✓ Material marked w/permanent marker	Check w/manufacturer
✖ Excessive hardness or brittleness	Indicates heat or uv damage

Stitching

Visual and Touch Inspection	
✖ Pulled stitches	
✖ Stitching that is missing	
✖ Hard or shiny spots	Indicates heat damage
✖ Cut stitches	
✖✓ Discoloration of stitching	Dependant on cause of discoloration

Hardware

Visual and Touch Inspection

- ✖ Distortion (twists, bends)
- ✖ Rough or sharp edges
- ✖ Rust or corrosion
- ✖ Cracks or breaks
- ✖ Broken/distorted grommets
- ✖ Modification by users (ie additional holes)
- ✖ Tongue buckle should overlap the buckle frame and move freely back and forth in their socket
- ✖ Roller of tongue buckle should turn freely on frame
- ✖ Bars must be straight
- ✖ All springs must be in working condition

Inspection Checklist – Fall Protection Equipment

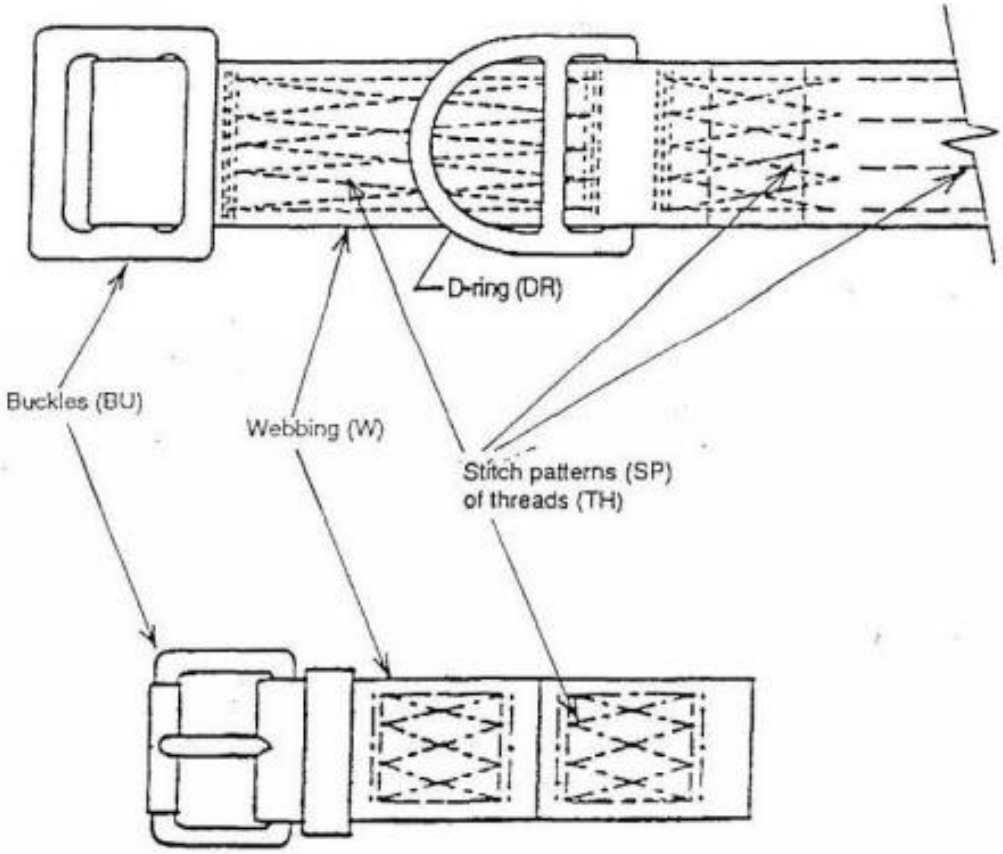
Description:	Model #:
Serial #:	Date of Manufacture:
Inspector:	Date Inspected:
Inspector Signature:	

✖FAIL: ❑ Initial_____
REMOVE FROM SERVICE

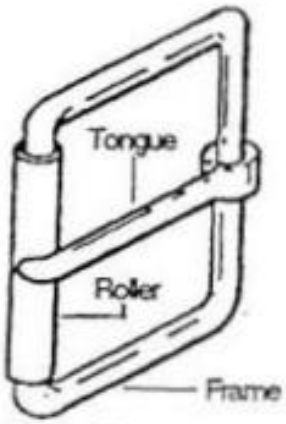
✓PASS: ❑ Initial_____
RETURN TO SERVICE

ITEM #	DESCRIPTION	FAIL ✖	PASS ✓	COMMENTS

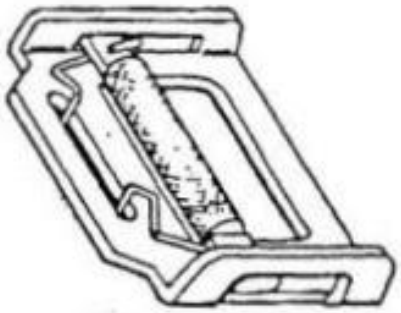
Harness Components

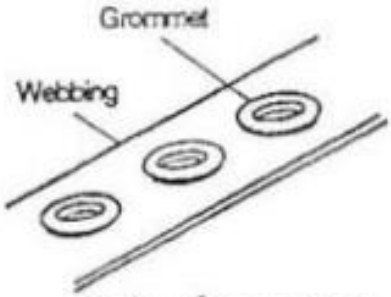



D-ring.



Buckle, tongue


Adjuster, webbing
(Also a buckle)



Grommets in webbing

Lanyard Inspection

Shock Absorbing Lanyard (Manyard Style)
Inspection – Guidelines

Webbing

Grasp the webbing with your hands and bend the webbing, checking both sides. This creates surface tension making damaged fibers or cuts easier to see. Webbing damage may not show up through a sight (visual) inspection only – manual (touch) the lanyard is equally important. **Pay attention to the wrinkled portion of the lanyard.**

Visual and Touch Inspection	✓ Pass ✖ Fail Criteria
✖ Cuts, nicks or tears	
✖ Broken fibers/cracks	
✖ Overall deterioration	
✖ Modifications by user	
✖ Fraying/Abrasions	
✖✓ Discoloration of material	Dependant on cause of discoloration
✖ Hard or shiny spots	Indicates heat damage
✖ Change in core size	Indicates possible fall
✓ Mildew	Clean lanyard
✖ Missing or popped flag	Indicates possible fall
✖ Undue Stretching	Indicates possible fall
✖ Burnt, charred or melted fibers	Indicates heat damage
✖✓ Material marked w/permanent marker	Check w/manufacturer
✖ Excessive hardness or brittleness	Indicates heat or uv damage
✖ Knots in lanyard	

Stitching

Visual and Touch Inspection	
✖ Pulled stitches	
✖ Stitching that is missing	
✖ Hard or shiny spots	Indicates heat damage
✖ Cut stitches	
✖✓ Discoloration of stitching	Dependant on cause of discoloration

2. Dust Mask/Face mask

a. The environment inside of a bin is very hazardous and can cause numerous respiratory issues. A dust mask will allow the bin entrant to have clean air to breathe while in the bin. A key thing to remember is when a bin entry must occur, running the aeration in the bin will also help reduce suspended dust around the worker and provide ample fresh air to the bin entrant.

b. One essential function a dust mask serves indirectly is protecting the bin entrant's mouth in the event of an engulfment. A dust mask can act as a barrier to prevent grain from coming into an engulfed person's mouth, which would otherwise cause the person to suffocate. If the grain does enter an engulfed person's mouth, it can swell due to moisture, and the person may be unable to remove the grain from his or her mouth.

c. Perform a "fit-test" by a trained administrator yearly to ensure the dust masks/respirators fit correctly and do not allow dust and other contaminants from getting past the respirator.

d. There are many different types, but when selecting respirators for entering a bin, the level of risk one is willing to take must be considered.

Most expensive, but offers the most protection

Cheapest, but offers the minimum amount of protection

** **IN AN EMERGENCY,** a ball cap can be used to cover your face if you become engulfed, and no other face protection is available. **DO NOT RELY ON A BALL CAP AS YOUR PRIMARY PPE** **

3. Atmospheric Monitoring

a. Often, the atmosphere within a grain bin contains lower levels of oxygen than what the human body needs to survive. Ventilation in the bin should be turned on during the entire time an entrant is in the bin. The attendant and levels should wear atmospheric monitoring devices such as oxygen monitoring devices, and harmful gas detection devices should be checked regularly.

b. Deadly gasses such as phosphine gas, fumigants, nitric oxide, nitrogen dioxide, nitrogen tetroxide, carbon monoxide, and more can be found with a grain bin. At low concentrations, gasses like these can cause respiratory irritation like coughing, nausea, and lightheadedness. In higher concentrations, they can quickly kill a person without proper protection. These gasses are often odorless and colorless, making them difficult to detect without an atmospheric monitor.

This device is an atmospheric monitor that provides real-time outputs of the atmospheric conditions inside of a confined space. Having a similar device with lights and warning sounds to prevent you from remaining in a hazardous environment could save your life!

REMEMBER:	**Never enter the bin without having an observer available to get help if something goes wrong!**

There are two main anchoring points to focus on when encountering the thought of grain bin entry. The first is one in the center of the ceiling of the grain bin or silo. An anchoring point in the ceiling is to offset the weight of a person from above, which could help in the case of entrapment. If their weight were to be held from the side with a rope, this could cause unintended force on the person at an unnatural angle and cause even more damage. The second main anchoring point should be at the top edge of the bin where entry occurs. An observer can control the amount of slack someone working in the bin has. This is better than a person just standing on a platform and holding a rope.

Walk-throughs

- It is vital to conduct a walk-through of the facility, preferably annually. This ensures that all personnel knows which structures are intended as major fastening points or just meant for belay lines.

- It is suggested local rescue groups join in on these walk-throughs as a rescue operation could operate more smoothly if they are familiar with the facility's layout.

Confined spaces:

Grain bins are what OSHA would classify as a **Confined Space.** Confined spaces are areas where a worker may have to enter for a variety of reasons. This space is a host to a variety of hazards that could be potentially life-threatening. The following information provides more insight into what confined spaces are and what a person should consider before approaching or entering a confined space.

What are confined spaces?

- Storage tanks
- Enclosed drains
- Silos
- Tunnels
- Pits
- Shafts
- Unventilated or poorly ventilated rooms

What are the dangers of confined spaces?

- Flammable vapors
- Excess oxygen
- High concentrations of dust
- Hot temperatures
- Lack of oxygen in the air
- Poisonous gas or fumes
- Asphyxiation due to debris

Safety precautions for confined work spaces

- Avoid entering confined spaces
- Use a safe system of work where suitable employees are appointed for the task when they are unavoidable
- Isolate the work space from unnecessary dangers like electricity or running water if necessary
- Make sure the area is an appropriate temperature before entering
- Confirm entrances are large enough to enter while wearing all proper equipment
- Complete air tests for oxygen levels or hazardous levels of gases to assess risk levels of entry
- Use non-sparking tools and extra low voltage equipment to prevent shock
- Use proper breathing apparatuses determined by the risk of the confined space
- Wear proper personal protective equipment for the job at hand
- Have an emergency plan incase something goes wrong
- Effectively communicate that there will be work going on in a confined space and have a way to communicate in cases of emergency

National Standard for Safety Colors: ANSI Z535-1.2011:

The purpose of the color standards is to help agricultural workers and other industries' workers learn what to expect with potential hazards based on repeatedly seeing signs with the same color schemes.

Colors	Use Case
Red	Fire protection equipment and apparatus, danger signs, containers of flammable liquids, lights at barricades, stop buttons/switches
Orange	Signs and equipment designating dangerous or energized machines/equipment
Yellow	Specific physical hazards including falling, tripping, and striking, and designating caution
Green	Safety information and first aid equipment
Blue	Information not immediately safety related (i.e. property policies)
Purple	The significance of these colors may be defined by the end user.
Grey	
Black	
White	
Combinations of Black, White, and / or Yellow	

Grain Bin Safety Signs and Labels:

Handling grain comes with many hazards, and it is important to label and explain these dangers clearly. Signs and labels should be made of appropriate materials for where they will be placed. Most common signs and labels are made of aluminum, PVC, vinyl, or a flexible magnet. With the use of safety signs and warning labels stating different precautions, there is an intended reduction of grain handling incidents. Signs and labels should be replaced as needed when worn or damaged to ensure they are always legible.

This symbol shows a harness should be used while in a grain bin due to the risk of entrapment. There should also be a second person to help in the case of an incident.

This symbol signifies the use of a fall protection harness when engaging in activities in or while working on the bin.

This label shows that the unloading of a grain bin should not occur while someone is inside. This increases the risk of engulfment and entrapment.

The risk of entanglement in an auger is shown by this symbol.

NOTICE

Important!

Once the grain bin is up check regularly to ensure anchor bolts are properly installed so the grain bin will be able to withstand high winds

⚠ WARNING

Suffocation Hazard

Surface may break through
Keep off surface

WHEN ACCESSING THE CENTRAL ROOF HATCH REMAIN ON THE LADDER KEEP SAFETY HARNESS ATTACHED AT ALL TIMES

⚠ CAUTION

Dust mask is required.

Breathing unfiltered air may damage lungs.

Animal Handling Safety

Personal Protective Equipment (PPE) Animal Safety

PPE is considered by the industry as the LAST LINE OF DEFENSE when protecting yourself from the various hazards associated with agricultural tasks.

Symbols used to represent PPE vary significantly from source to source. For this notebook, we will use the following symbols with the following meanings:

Hard Hat/Bump Cap: This symbol indicates that a user should or is required to wear a hard hat or bump cap while working in and around livestock facilities with low clearance to protect their head from bumps and bruises that can occur when working with livestock.

Steel or Composite, Closed-Toe Shoes: This symbol indicates that closed-toe shoes (preferably leather and steel toes) should be worn when around livestock. Rugged shoes can protect animal hooves, dropped items, and sharp objects. Skid-resistant shoes can protect against slips on wet, muddy, or manure-covered surfaces.

Safety Glasses: This symbol indicates that safety glasses should be worn at all times to protect the eyes from dust, trash, chemicals, and flying pieces.

Gloves: This symbol indicates that gloves should be worn when working with livestock while doing specific tasks. Several types of gloves can be worn for different tasks. Rubber ones can be used when assisting with livestock birth or treatment, while cloth ones can be worn when doing manual labor.

Dust Mask: This symbol indicates that a user should wear a dust mask while cleaning up around livestock, handling dusty or moldy hay, working in silos and manure storage facilities, and some pest control operations.

Safe Operational Procedures for Animals

AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Cattle

DO NOT **work with this animal unless you have been instructed on its safe handling procedures and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this animal and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to animal handling.

PERSONAL PROTECTIVE EQUIPMENT

SPECIAL CONSIDERATIONS

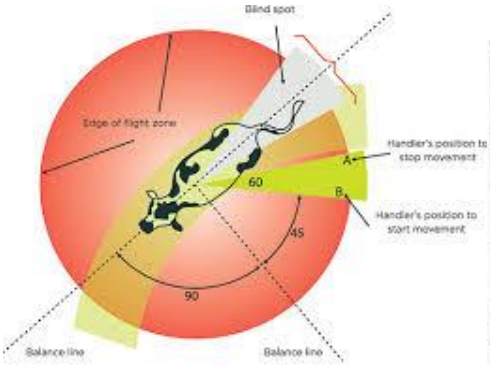
- ✓ Cattle can see nearly 360 degrees without moving their heads which causes them to be spooked easily.
- ✓ Small animals such as dogs tend to upset cattle and could result in spooking the cattle.
- ✓ Announce when you are approaching a cow by a gentle touch as not to spook the cattle.
- ✓ Cattle can become very dangerous when cows perceive harm potentially coming to their calves.
- ✓ Ensure if you or someone else is approaching a calf, the mother cow is always in the field of view.
- ✓ Special facilities should be in place to keep the bull away from areas frequented by visitors.
- ✓ Always ensure cattle are in a contained area.
- ✓ When moving cattle into confined spaces, i.e., a squeeze shoot or milking parlor, always allow for the cattle to become aware of their surroundings before working.
- ✓ Always have an "out" to escape if something goes wrong while working cattle.

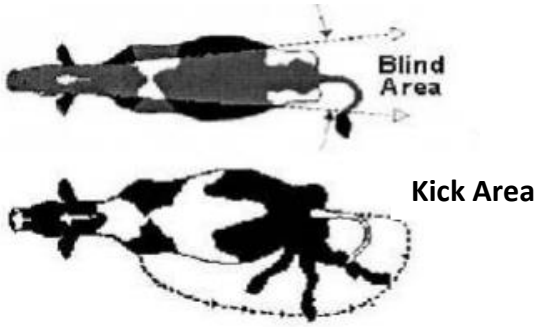
POTENTIAL HAZARDS AND INJURIES

- ⓘ Kicks
- ⓘ Lacerations and bruising
- ⓘ Bruising
- ⓘ Broken or fractured bones
- ⓘ Being crushed

DON'T

- ✘ Do not allow kids and strangers around moving cattle.
- ✘ Do not shove cattle around.
- ✘ Do not leave gates open to cattle.
- ✘ Do not stand in a cow's blind spot.





AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Swine

DO NOT **work with this animal unless you have been instructed on its safe handling procedures and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this animal and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to animal handling.

PERSONAL PROTECTIVE EQUIPMENT

SPECIAL CONSIDERATIONS

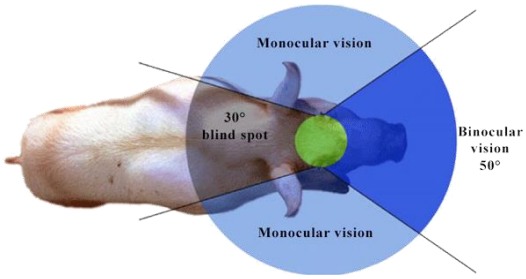
- ✓ Hogs are generally not aggressive but may become when they feel threatened or protecting their young.
- ✓ Moving swine can result in injury and is best done with panels or gates to guide them.
- ✓ Veterinary work and treatment should be done when the young and the sow are separate.
- ✓ Always make yourself known before entering a pen or working with the swine by speaking in low tones.
- ✓ Ensure if you or someone else is approaching a piglet, the sow is always in the field of view.
- ✓ Swine can easily be guided backward by placing a basket or box over its head as it will try to back out from under the basket.
- ✓ Be aware of the hog's mouth because biting is a common defense when a hog feels threatened.

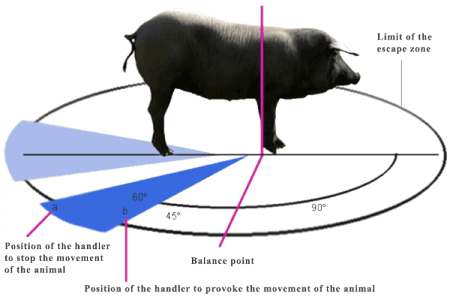
POTENTIAL HAZARDS AND INJURIES

- ⓘ Bites
- ⓘ Being crushed or knocked down
- ⓘ Lacerations and puncture wounds
- ⓘ Infections and toxemia

DON'T

- ✘ Do not allow kids and strangers to stick hands into pens.
- ✘ Do not attempt to move swine alone.
- ✘ Do not allow unauthorized people into hog lots.
- ✘ Do not use your knees or hands solely to stop a moving hog.
- ✘ Do not enter a pen without a way to get out.





AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety Safe Operational Procedure (SOP)

Horses

***DO NOT* work with this animal unless you have been instructed on its safe handling procedures and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this animal and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to animal handling.

PERSONAL PROTECTIVE EQUIPMENT

SPECIAL CONSIDERATIONS

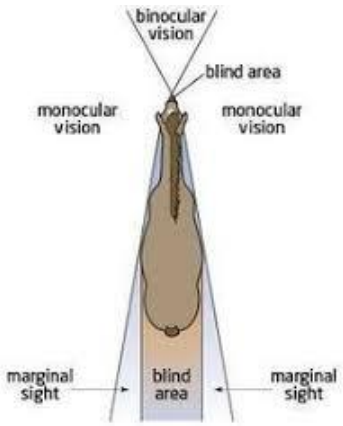
- ✓ Speak to a horse as you approach it to let it know you are coming.
- ✓ Exercise caution when approaching a horse that is preoccupied with something else.
- ✓ When approaching a horse in a stall, ensure it is facing you, and the horse is aware you are about to enter.
- ✓ If approaching a horse from behind, come toward it at an angle while speaking to them.
- ✓ If using a horse for horseback riding, ensure all equipment is in good condition and is maintained well.
- ✓ Exercise caution on horses when in and around muddy conditions.
- ✓ Make sure before leaving a child or stranger unsupervised on a horse, they are comfortable and familiar with riding a horse.
- ✓ Always maintain four points of contact with your horse when riding.
- ✓ When leading a horse, always have two hands on the horse.
- ✓ Always lead with a lead line to prevent your hand from getting caught in the halter.
- ✓ Always have your horse walk beside you as opposed to in front of or behind.

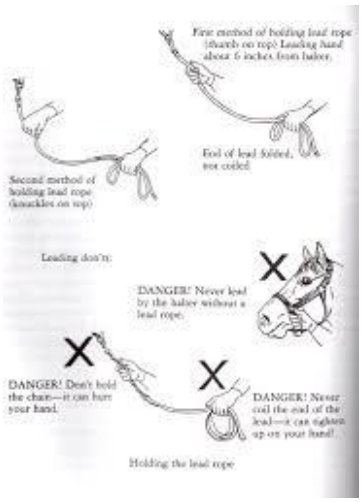
POTENTIAL HAZARDS AND INJURIES

- ⓘ Bites
- ⓘ Being crushed or knocked down
- ⓘ Lacerations and puncture wounds
- ⓘ Head injuries or concussions
- ⓘ Broken bones

DON'T

- ✘ Do not mount a horse that is temperamental or high-spirited if you are not a skilled rider.
- ✘ Never mount a horse when there is little clearance.
- ✘ Never wrap any piece of equipment that is attached to the horse around your hand.
- ✘ Do not climb over or under a lead line tied to a horse.
- ✘ Never walk under the belly of a horse.





AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety Safe Operational Procedure (SOP)

Sheep

DO NOT **work with this animal unless you have been instructed on its safe handling procedures and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this animal and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to animal handling.

PERSONAL PROTECTIVE EQUIPMENT

SPECIAL CONSIDERATIONS

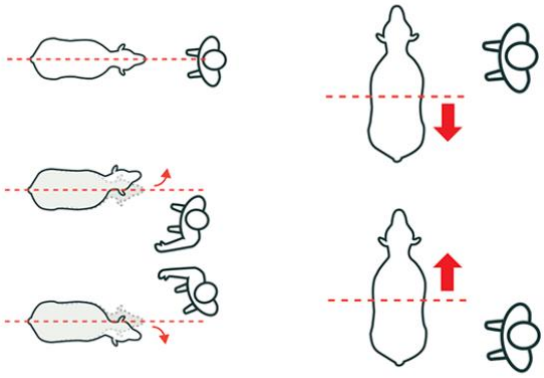
- ✓ Ewes will be highly protective of their young, so approach a ewe and her young with caution.
- ✓ Sheep are commonly immobilized for safe handling by "casting," which is sitting them up on their rump and tilting them back to keep their rear hooves are off the ground.
- ✓ After moving sheep, allow them time to become aware of their surroundings before working with them.
- ✓ Be aware of a sheep's "flight zone" and how close you can get to them before they begin to flee.
- ✓ A neck or leg crock can be used to catch sheep.
- ✓ Lift sheep using your legs, as opposed to lifting with your back.
- ✓ If using dogs around sheep, ensure they are well trained.
- ✓ Use gates or hurdles to catch and move sheep easier.
- ✓ When catching sheep, grab them under the chin to have a secure grip.
- ✓ Avoid putting body parts in front of moving sheep to stop them.

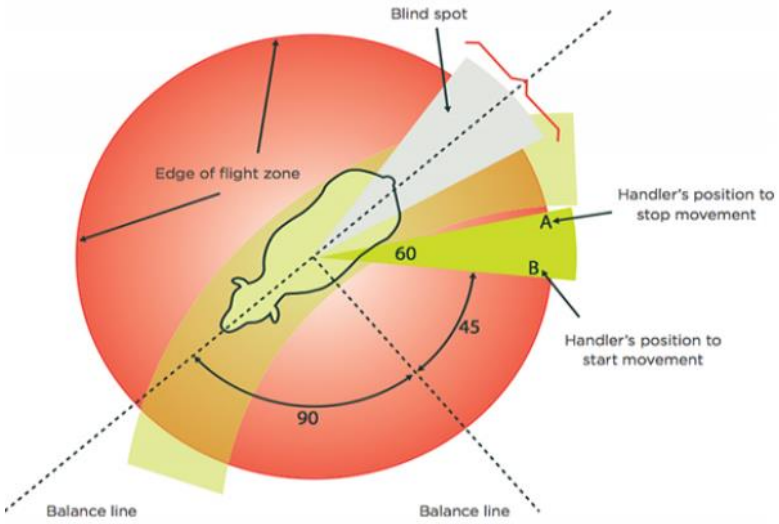
POTENTIAL HAZARDS AND INJURIES

- ⓘ Bites
- ⓘ Being crushed or knocked down
- ⓘ Back strain
- ⓘ Knee injuries
- ⓘ Broken bones

DON'T

- ✘ Do not grab a sheep by pulling on its wool.
- ✘ Do not chase sheep to catch them.
- ✘ Do not lift sheep alone.
- ✘ Do not attempt to move sheep alone.





AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Poultry

DO NOT **work with this animal unless you have been instructed on its safe handling procedures and have been given permission**

This SOP does not necessarily cover all possible hazards associated with this animal and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to animal handling.

PERSONAL PROTECTIVE EQUIPMENT

SPECIAL CONSIDERATIONS

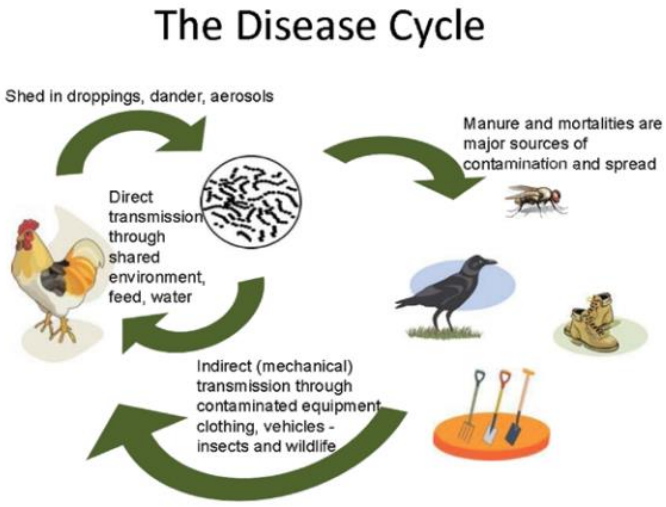
- ✓ Always wash your hands after handling poultry.
- ✓ Always supervise children when handling poultry.
- ✓ Beware, Salmonella can be found on or around poultry.
- ✓ Clean pens and surrounding areas regularly to prevent contamination and the spreading of diseases.
- ✓ Shoes worn into pens can become contaminated. For biosecurity reasons, have a pair of shoes that are solely used for entering poultry pens.
- ✓ Clean all poultry equipment outside to prevent diseases and bacteria from entering the home.
- ✓ Always throw out broken or dirty eggs that might harbor harmful bacteria from the poultry.
- ✓ Avoid scratches and bites from poultry because they could result in a bacterial infection.
- ✓ Regularly receive a tetanus shot to prevent bacterial infections when working around poultry.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Bites
- ⓘ Scratches
- ⓘ Bacterial infections
- ⓘ Salmonella

DON'T

- ✘ Do not allow young children to handle poultry.
- ✘ Do not allow children to put poultry on or near their faces.
- ✘ Do not take poultry into houses or other areas where food is kept.



AGRICULTURAL SAFETY
BY CLEMSON® EXTENSION

Clemson Agricultural Safety
Safe Operational Procedure (SOP)
Goats

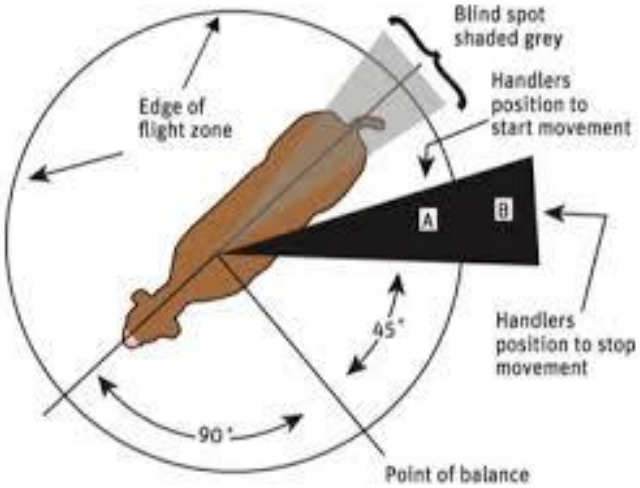
DO NOT work with this animal unless you have been instructed on its safe handling procedures and have been given permission

This SOP does not necessarily cover all possible hazards associated with this animal and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to animal handling.

PERSONAL PROTECTIVE EQUIPMENT

SPECIAL CONSIDERATIONS

- ✓ Goats are more susceptible to parasites from grazing than most other animals.
- ✓ Limit foot traffic in enclosures. Have separate pair of shoes to prevent contamination between pens.
- ✓ Check hooves monthly for trimming needs and any case of infection or rot.
- ✓ Goats stress very easily, so when moving them, allow them time to readjust to their surroundings.
- ✓ Perform all health checks and maintenance while the goat is in the standing position.
- ✓ Goats are herd animals and will act more calmly if they remain in the herd when performing work on or with the goat.



- ✓ Goats may vocalize when they need food, water, shelter, etc., and they are in danger.
- ✓ Be aware of all exits of an enclosure, as goats will more than likely find a way out.
- ✓ Always clean equipment used when working with goats.
- ✓ Horn covers can be placed over the horns if need be.

POTENTIAL HAZARDS AND INJURIES

- ⓘ Bites
- ⓘ Headbutting
- ⓘ Bacterial infections
- ⓘ Puncture wounds

DON'T

- ✘ Do not pick up or drag goats by their horns.
- ✘ Do not pull on goats by their hair or legs.
- ✘ Do not try to transport a goat that is sick or ill.

Pesticide Safety

Pesticide Safety Fact Sheet

DESCRIPTION

The objective of this fact sheet is to provide the reader with valuable information about how to handle, use, and dispose of pesticides safely.

WHY?

- To protect people, both yourself and others.
- To protect the environment, including, but not limited to, water, plants, and animals.

HUMAN HARM

Humans can be poisoned or injured by pesticides. Poisoning results when pesticides enter the body and cause internal harm. Injury results when pesticides come in contact with the external body and cause damage. The measure of how harmful a pesticide is its toxicity level. Toxicity is dependent upon the amount of pesticide exposure. Exposure is when a pesticide comes in contact with any part of a person's body.

RESPONDING TO POISONING EMERGENCY

1. Stop pesticide exposure
2. Call for emergency help
3. Check the label to determine if anything can be done before help arrives.

SKIN EXPOSURE

1. Drench skin with water
2. Remove PPE/contaminated clothing
3. Wash skin/hair thoroughly with mild detergent
4. Cover victim and prevent overheating or becoming too cold
5. Use a soft, loose bandage for burns.

Do not apply creams or powders.

OCULAR EXPOSURE

1. Quickly wash eyes with a gentle drip of clean water for 15+ minutes.

Do not add anything to the water!

INHALATION OF PESTICIDE

1. Get victim and anyone nearby to fresh air.
2. Loosen tight clothing and use artificial respiration is necessary.

Use a breathing barrier, if available, to prevent direct contact in mouth-to-mouth.

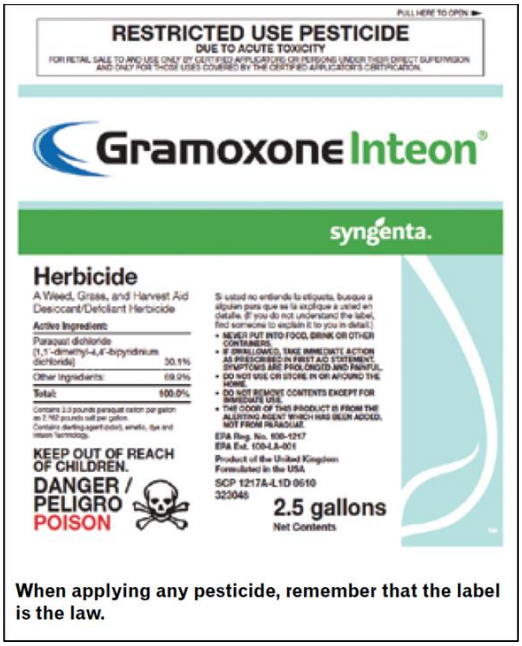
MOUTH EXPOSURE

1. Rinse mouth
2. Give victim plenty of water or milk to drink.

Only induce vomiting if instructed on the label.

LABEL AND CLASSIFICATION

Pesticide labeling is the law and must be followed. There are two classifications for pesticides, unclassified and restricted. Unclassified, or general use, do not require a pesticide certification to purchase and use. Restricted, or RUP (Restricted Use Pesticide), pesticides could cause harm to humans and the environment. These require a certification/license to purchase and use.



When applying any pesticide, remember that the label is the law.

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Questions

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