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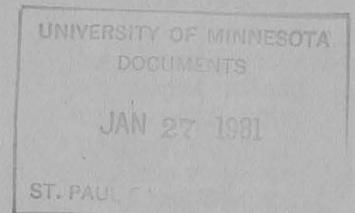
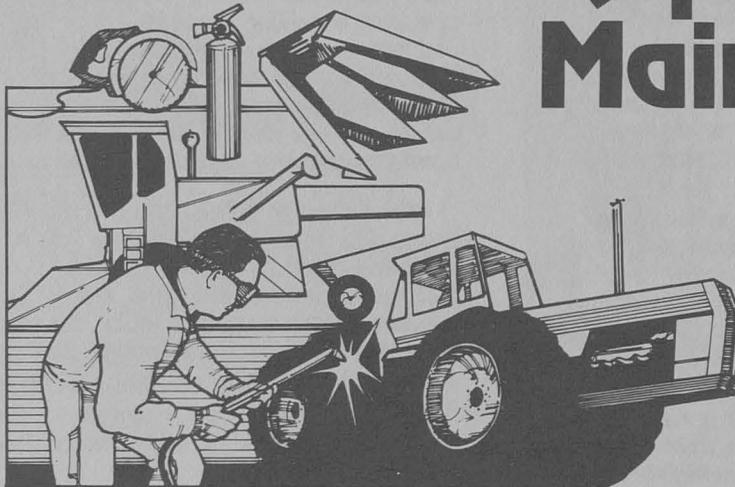
Agricultural Extension Service  
University of Minnesota

Robert A. Aherin

Lee Schultz

John True

# SAFE USE OF FARM MACHINERY— Repair and Maintenance



Most farmers today use a variety of complex machinery to till, plant, and harvest their field crops. With initial investments high and downtime expensive—especially during planting and harvesting seasons—it is important to keep that machinery in good working order and make the inevitable repairs and adjustments as quickly as possible.

But repairing and maintaining farm machinery can lead to serious injury and be costly in many ways. According to recent studies, about 15 percent of all farm machinery accidents occur while the farm worker is adjusting, unclogging, or repairing farm equipment. A farm worker who tries to make repairs but doesn't have the necessary skills, tools, or proper work environment can more than double his or her downtime—and pay dearly in lost production time, medical costs, property damage, suffering, and grief.

## Potential Hazards \_\_\_\_\_

Many hazards exist when you are repairing and maintaining farm equipment. But you can recognize and control those hazards and, in doing so, minimize the accident potential on your farm.

Read over the following list of common potential hazards. How many sound familiar to you? How often do you take risks that don't need to be taken?

1. Lifting incorrectly and lifting items that are too heavy for one person are common causes of back injury, resulting in lost work time or even permanent injury.
2. Heavy or sharp items dropped on your hands or feet can smash or cut. The worker who fails to wear gloves or hard-toed shoes when doing

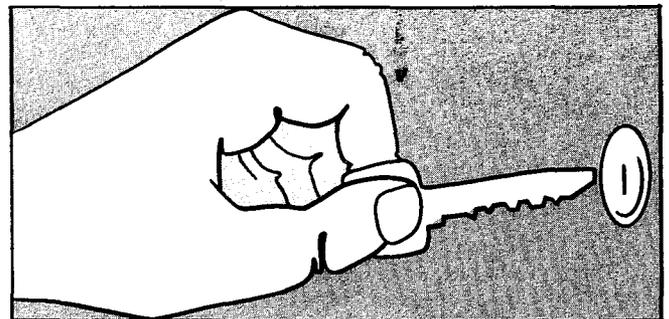
heavy work often suffers the worst injuries.

3. Poorly maintained tools, such as a chisel with a mushroom head, can result in injuries. Striking the head of that chisel could cause a piece of metal to fly off and hit someone in the face or body, or the worker could cut his hand on the ragged edge of the chisel.
4. When you use the wrong tool for a job, an injury can result. For example, it may be tempting to use a crescent wrench in place of a hammer if a hammer is not available, but the wrench can glance off an item at an unexpected angle and cause an injury.
5. It is common to see grinding wheels without protective aids. Using unguarded and unshielded grinding wheels can result in serious injury. Fragments of a shattered grinding wheel can be thrown and can strike you in the face or body.
6. A substandard or obsolete wiring system in the farm shop can cause a serious, if not fatal, shock. The old two-wire outlets and electric power tools are a constant hazard because they do not provide a ground. A short may develop, exposing the worker to an electric shock from the power tool or from dampness in the work area.
7. Working and repairing items from an elevated position with a ladder can be hazardous if the ladder is in poor condition or improperly positioned. Working from hydraulically-supported machinery also can be dangerous if there are no side rails and footing is uneven.
8. Personal protective equipment often is not available or is not located where it is needed. Injuries to the face, hands, feet, or trunk can result, if you are not properly protected.
9. Repairing equipment while machinery is running often causes the worker to become entangled.
10. Often, machinery repaired in the field is not properly stabilized. The machine can move or fall on you and cause a serious or fatal injury.



**Keep operating and repair manuals handy and read them.** Maintaining expensive equipment in safe operating condition requires a thorough knowledge of machine operation. Your operating and repair manuals provide essential information and procedures for maintaining your machinery. Operational checks before use will identify those items that are not operating properly and need attention.

**Take time to think.** When a machine does break down, you must decide whether you have the ability to do the necessary repairs and if you have the facilities to perform this work safely. Taking a few minutes before starting a repair job and determining if you have the time, knowledge, and right tools and equipment can save time and money and prevent accidents.



**Be sure the machine is turned off.** Before attempting any work on a farm machine, turn off the engine and remove the key if the machine is equipped with one. When working with diesel engines, shut off the fuel and leave in the off position to prevent accidental starts. A machine that is running while you are repairing, unclogging, or adjusting can catch parts of your body and pull you in, causing serious injury or death.

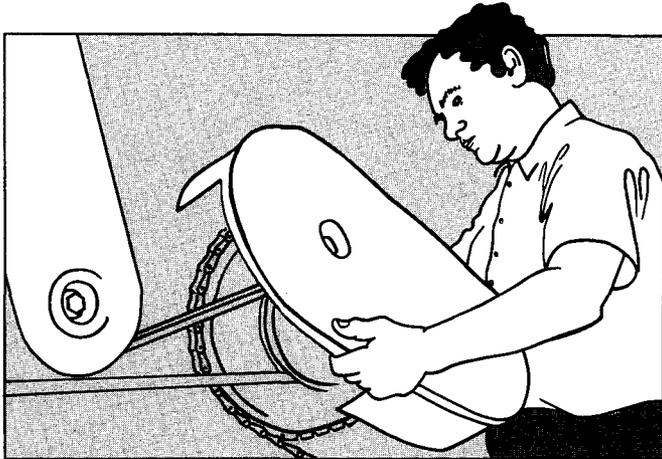
**Stabilize machinery properly.** To prevent the machine from moving or falling when you are working on it, block the wheels to keep it from

## Safe Work Habits

Although conditions and machines vary from farm to farm, you can avoid many hazards found on all farms by developing safe work habits.

**Maintain machinery properly.** Accidents are more likely to happen when a machine is out of adjustment, cutting edges are dull, or worn or broken parts need replacement. Avoiding breakdowns and costly repair bills through a proper maintenance schedule will help make your farm work efficient and accident free.

rolling and use blocks of wood in conjunction with a good jack or hoist to secure raised parts. Other safety devices available are locks on hydraulically-supported parts, pins inserted to secure hydraulically-supported parts in the raised position, and safety catches on a hoist.



**Keep shields and guards in place.** Shields or guards often must be removed to obtain access to areas in need of repair. Replacing these guards immediately after completing repair work protects the farm worker and others nearby from becoming accidentally entangled or injured.

**Pay attention to danger decals.** On new farm machinery, manufacturers have placed safety alert decals near points of danger. Caution, warning, and danger symbols direct attention to potentially unsafe or hazardous areas.

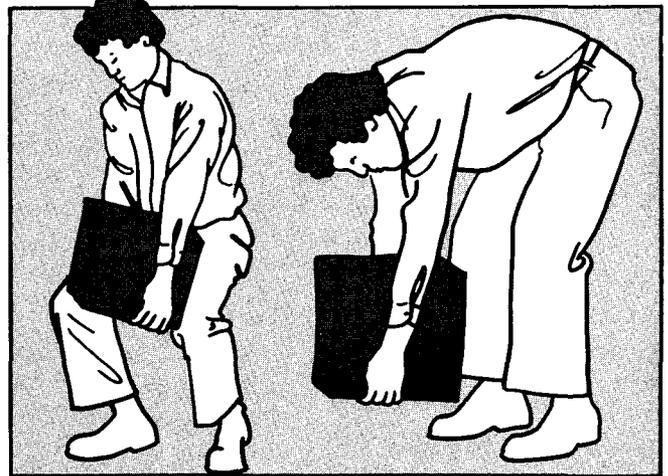


**Clean machine parts before repairing or adjusting.** In many instances machine parts should be cleaned before attempting to make repairs or adjustments. Care should be taken when cleaning parts with compressed air. Wear goggles to provide eye protection. To avoid exposure and serious injury to skin tissue, air pressure should not exceed 30 pounds per square inch (psi). Clean or remove grease and oil with a cleaning solvent; never use gasoline. Solvents are available which are not harsh on the skin and are not nearly as flammable as

gasoline. Wearing rubber gloves during exposure will prevent skin irritation and absorption of chemicals into the bloodstream.

**Use ladders properly.** Working in high places is always potentially dangerous. As a general rule, portable ladders should be placed firmly on the ground about one-quarter of the height of the ladder away from a wall or machine. Metal ladders, which are excellent conductors of electricity, should not be used near electric lines. It is recommended that fixed ladders over 20 feet high be equipped with cages and that landing platforms be placed every 30 feet. These precautions will help prevent serious injuries from falls.

*Correct (left) and incorrect methods of lifting*



**Lift correctly.** A back injury can mean pain, expense, lost time, inconvenience, and/or disability. Most people take the good health of their backs for granted and have to be taught how to use their backs correctly for lifting. Lifting is among the activities that subject the body to its greatest physical stress. A natural and recommended method of lifting is where the worker bends the knees and uses the legs to lift the weight of the object. This allows the spine to assume an angle that is most comfortable and natural for the worker.

## A Hazard-free Shop \_\_\_\_\_

A well-equipped shop usually can provide safe and adequate facilities for the major portion of repair and maintenance work needed on the farm.

Examples of facilities and equipment that a farm shop might have are:

- a well-lighted workbench and parts bin, to make jobs faster, safer, and less stressful.
- a three-wire, grounded, 120-volt outlet system with a ground fault circuit interrupter available, to



protect the operator from electric shock if the equipment shorts out.

- a metal storage cabinet for paints and solvents, to reduce fire hazard by isolating flammable liquids.
- a metal container for storage of oily rags, to reduce the danger of a spontaneous combustion fire by eliminating oxygen that feeds a fire.
- a separate area for welding, away from combustible materials to avoid starting a fire. Forced ventilation is recommended in a closed area to remove fumes and gases. Compressed gas cylinders should be secured in a portable cart or chained to a wall or other sound structure to protect them from falling and knocking off the valve controls, which may cause the cylinder to propel out of control.
- an inventory of personal protective devices such as
  - leather gloves, to protect your hands when performing heavy work, or rubber gloves, when using solvents or acids.
  - face shields and safety glasses, to protect your eyes from flying particles or chemical agents.
  - ear muffs or plugs, to prevent hearing damage from high noise levels.
  - bump or hard hats, to protect your head from being bumped or cut by falling objects.
- an apron, to protect your body from burning particles when welding or when handling dangerous liquids.
- a welding helmet with shaded lens plate, to protect your head and eyes from flying particles and ultraviolet and infrared radiation.
- a dust mask, to protect your lungs and nose from dust particles.
- hard-toed shoes, to protect your feet from the impact of falling objects.
- a grinding wheel with safety aids including wheel guard, shatterproof shields, and tool rest positioned slightly above center and 1/8 inch away from the wheel. The wheel guard protects the operator from the possibility of the wheel shattering. The properly positioned tool rest prevents thin pieces of metal and your fingers from being wedged between the wheel and tool rest.
- hand tools maintained in good condition, so that they perform as they were designed.
- a well-organized and clean work area. Good housekeeping will reduce the fire hazard and the chances of falling on a slippery, oily floor.

## Be Prepared for Emergencies

When an emergency occurs, a first aid kit is a valuable item. First aid given immediately can prevent serious infection. As many individuals as possible who live and work on your farm should be trained in first aid procedures, so that assistance can be provided until medical help can be obtained. Phone numbers for obtaining medical assistance from your local health care facility should be posted.

Fire extinguishers should be located in convenient locations around the farmstead and on all self-propelled farm equipment. The ABC-rated, dry chemical fire extinguisher is considered the best all-around type because it is effective against all three major classes of fires. It is recommended on combines, tractors, and farm trucks where fires involve materials such as straw and flammable liquids such as oil.

## Summary

Maintenance and repair of farm machinery is an integral part of farm work. Recognizing potentially hazardous conditions and putting them under control will reduce injuries and costly downtime. Maintain farm machinery in safe operating condition to avoid accidents. When performing maintenance and repair work on your machinery:

- Be aware of common potential hazards.
- Develop safe work habits.
- Maintain a hazard-free work area.
- Be prepared for emergencies.

## References

1. *Fundamentals of Machine Operation—Agricultural Machinery Safety*; Deere and Company; Moline, Illinois
2. "The Human Factors in Accident Prevention and the Prevention and Control of Back Injuries"—provided to the American Loss Control Institute by Leonard Ring, M.Sc., M.C.S.P. (Eng.), Auckland University, Auckland, New Zealand

Robert A. Aherin is extension program safety specialist, Lee Schultz is assistant extension safety specialist, and John True is extension agricultural engineer.

This material has been funded in whole or in part with Federal funds from the U.S. Department of Labor under grant number DOL/9P305017. Individuals undertaking such projects under Government sponsorship are encouraged to express freely their professional judgement. Therefore, these materials do not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

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