

Large Round Bales: Safety¹

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The key to safe and efficient large round bale systems is an operator who knows the hazards involved and who follows safety practices that can prevent large round bale accidents. Operators must be constantly alert for situations that may cause injuries to themselves or others. On top of pain and suffering, accidents contribute to higher costs in terms of unnecessary down-time or costly machine repairs. Alertness and safety consciousness can result in more efficient and profitable baling and handling.

Developing your safety awareness begins with the operator's manual. Take time to read the manual and become reacquainted with the machine at the beginning of each season. Insist that all operators are trained and acquainted with all the safety precautions in the manual. Initial training of employees and annual training thereafter is a legal requirement for certain operators of large farms as part of the Occupational Safety and Health Act standard (29 CFR 1928.57) for the Guarding of Farm Field, Farmstead Equipment and Cotton Gins.

Allow only responsible, trained persons to operate the baler or bale handling equipment. Operators should become familiar with machinery maintenance and operation procedures, including crop conditioning and bale handling equipment and techniques. Especially important is a thorough knowledge of attachments required to bale different materials and types of windrows.

PRE-BALING MACHINE PREPARATION

Safe operation during baling depends in part on how well the baler is prepared for use before the season starts. This preparation may reduce field down time and also may prevent an accident. This pre-season preparation will also allow necessary lead time to get needed replacement parts and to do a thorough preparation job. Before servicing, performing a pre-operational check, unplugging, or adjusting the baler, always disengage the power takeoff, shut off the tractor engine, and take the ignition key with you. This will prevent someone from starting the equipment while you are servicing, repairing, or unplugging it.

Your pre-baling preparation should include these procedures, which can help detect potential safety hazards and improve the efficiency of your machine⁸

- Thoroughly clean the baler to remove any accumulated field trash, bird nests or other debris and lubricate all parts according to the manufacturer's recommendations. Proper lubrication can reduce unnecessary wear on parts and prevent overheating that could cause a fire.
- Carefully check for loose or missing nuts, screws, guards or bent pickup teeth. Replace missing guards to prevent accidental contact with the components they guard. Replace bent or missing pickup teeth to ensure effective feeding of material into the feed rolls.
- Inspect all belts or chains for evidence of wear or breakage. Maintain belt tension according to the manufacturer's recommendations. Belt lengths

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should be matched to prevent slippage which can cause plugging and belt damage due to heat buildup. Belts that must be spliced should be trimmed and laced squarely. New belts should be checked periodically until they are run-in and length has stabilized. Before replacing a belt or chain, consult the operator's manual for instructions on securing the upper chain or removing the load from the belt tension springs.

Make sure the hydraulic hoses are clean and in good repair and hooked up correctly. Check the twine feeding and cutting mechanisms to make sure that they are working properly and that your twine is in good condition. Also check the slip clutch, roll scraper, and rear gate latch to make sure they are adjusted and functioning according to the manufacturer's recommendations.

Finally, check all lights and warning reflectors and clean your slow-moving vehicle (SMV) emblem. Check your fire extinguisher to make sure it is in proper operating condition. For help in the selection and use of a fire extinguisher, ask for a copy of MU publication G01906, *Selecting and Using a Fire Extinguisher*, at your local University Extension center.

CROP PREPARATION AND BALING

Repeated plugging of the baler may cause the operator to become impatient and to try unplugging the baler while it is running. Never try to unplug the baler until you have disengaged the power takeoff and shut off the tractor engine.

Best results for forming a good bale core and reducing plugging begin with a properly formed windrow. The material should be well cured (20 percent moisture), and the windrow should be uniform, moderately heavy and about equal to half the width of the pickup, or about equal to the full width of the pickup. Use special care on residue crops such as corn stalks and straw, and consult your operator's manual for special instructions.

Vary tractor throttle settings to match crop conditions and windrow size. Operator manuals give information on tractor throttle settings and driving techniques for the material being baled. Always maintain the engine speed so that the pickup can operate efficiently to prevent bunching and slug feeding. Adjust the pickup for maximum ground clearance to allow for clean pickup and to avoid excessive pickup of rocks and debris.

After cleaning out a plugged machine - remember, never unplug a machine while it is running - spread the bunched material in a windrow for pickup in a normal manner. Never attempt to feed the material into the baler by hand or feet. One slip could be deadly!

Also never attempt to hand feed or remove twine from the machine while it is running. Simultaneous introduction of hay and twine can correct a failure of twine to enter the baler.

After you have completed the bale but before you eject the bale or open the rear gate, make sure everyone is a safe distance from the rear of the baler. Bales are a hard, tightly rolled mass, weighing as much as 3,000 pounds, and they could injure or kill bystanders by crushing them. Discharge the bale on level ground to prevent injury or property damage from an out-of-control rolling bale; position the bale so it won't roll.

If for any reason you must work around the gate area or in the bale chamber, disengage the power takeoff, stop the engine, set the parking brake and remove the ignition key. Engage the mechanical gate safety lock before starting to work in the gate area.

Also, instruct everyone to stay away from the tractor and hydraulic controls while you perform the necessary service.

BALE HANDLING

Now that you have this large round bale, you have to handle it mechanically.

As with any new system of materials handling, there are a number of different handling ideas. Some are good and some can cause problems. When selecting a handling unit, look for ones with safety features that meet your use and storage practices. For example, could the one with the impaling shaft also accidentally pierce a person? Is your power unit big enough to handle the bale, or will you be overloading the tractor? Does the manufacturer have safe handling procedures outlined in the owner's manual?

Center of gravity is important in handling big round bales. The load should be kept as low as possible. A top-heavy condition can lead to a backward or side overturn.

When moving a bale, make sure to use controls smoothly, avoiding "jerky" movements. Do not travel too fast and make sure that there is adequate ballast on the front and rear to counterbalance the load.

Keep the load as low as possible. Avoid steep hillsides as much as possible. Severe braking of a tractor while going at an angle down a slight embankment can cause the tractor to overturn. When picking up a bale on a steep hillside, work from the downhill side. Always be aware that the bale could roll down the hill.

Using a regular front end loader to move bales poses a problem since the bale can roll out of the bucket and down the loader arms onto the operator. Do not lift round bales with the standard loader unless you have proper bale restraining devices. In general, agricultural tractor roll-over protective structures (ROPS) are not intended to protect against falling bales. Failure to follow these instructions may result in serious crushing injuries or death for the tractor operator.

MOVING BALES OR EQUIPMENT ON PUBLIC ROADS

Movement of agriculture equipment on highways and roads requires special care. Moving a number of large bales at one time can cause braking problems. Always make sure that the load being pulled is no heavier than the pulling unit. Also, use the same gear going down a hill as you would going up a hill. Keep in mind that most tractors have only two wheel brakes. Five or six bales on a trailer may give a weight of 9,000 to 10,000 pounds.

Make sure the load you are moving is not too wide. As a general rule, if you are moving bales for your own use, you are exempt from the wide load requirements. But if you are moving bales that are sold or hauling them to a sale, you will need a wide load permit. Finally, be sure that your slow-moving vehicle emblem, reflectors and lights are in proper working order and meet state requirements. For your own protection, check with the highway patrol or sheriff concerning the movement of agriculture equipment and bale loads on public roads.