



Safety Devices for Tractors

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Tractors play a major role on the farm. Tractors are the most common piece of farm equipment. They transport equipment and material, pull implements, and provide power for other equipment. Their size and strength can be the source of harm when not used properly. Tractors are used on rough, uneven ground and can make sharp turns. If this is done at high speeds, or by an untrained operator, it can cause injury. Loss of human life brings great loss to victim's family and to the society. The tractor and implements related accidents can be reduced by installing safety gadgets or measures and by following safety guidelines during use.

Slow moving vehicle (SMV) emblems

Every tractor and self-propelled farm vehicle that uses the public roads at a speed less than the normal speed of traffic (most states define this as under 25 MPH) should have a slow moving vehicle (SMV) emblem. Towed implements may need the same type of emblem. SMV emblems are made of specially designed, reflective material that is visible from a great distance. SMV emblems are to be placed in the centre of the tractor or implement and should be fastened between 2 to 10 feet above the roadway. SMV emblems fade in time due to sun and weather exposure. When this happens, replace the SMV emblem. When the SMV emblem becomes dirty, wash it.

Rollover protective structure (ROPS)

One of the key safety features on a tractor is the rollover protective structure (ROPS). When ROPS are used along with seatbelts they can virtually eliminate death and serious injury. ROPS protective frame and crush resistant cab, when used in conjunction with a seatbelt, can reduce the number of serious and often fatal injuries to tractor drivers. The seatbelt holds the operator within the protective frame if an overturn takes place. When used with a seatbelt, a ROPS is 99% effective in preventing deaths in tractor related incidents. Most overturns are associated with farm-related activities such as driving over hazards like rocks, stumps, and holes; running into ditches; hitching high on the tractor when pulling implements; driving up steep slopes; and operating front-end loaders.

Overturn injury prevention tips

- Wear a seatbelt while operating a tractor with a ROPS.
- Install factory made ROPS on tractors. Homemade ROPS may not provide the needed support if an overturn takes place.
- Take special caution when operating a tractor on a bumpy and sloping surface.
- Keep foldable ROPS up during operation.

Power Take-Off (PTO)

Power Take-Offs (PTO) are used on the farm to transfer power from the tractor to another implement such as a grain auger, manure spreader, mower, or feed grinder. They are found on most tractors. PTOs operate by turning at speeds of 540 or 1,000 rotations per minute. This speed and the



device make the PTO very dangerous. An entanglement can occur in the driveline between the tractor and the implement and can cause some of the most serious injuries on the farm. Equipment manufacturers provide shields for PTO drivelines to protect operators and bystanders from becoming entangled in the rapidly spinning shaft.

PTO related injury prevention

- Make sure all PTO shields are in place and in good condition.
- Never step over a PTO while it is running, even if it is shielded.
- Do not wear jewelry or loose clothing, and tie long hair back so these items cannot come into contact with any part of the PTO.

Table: Mechanical hazards and prevention

Hazard Name	Explanation	Dangers	Prevention
Pinch Point	Two parts move together and there is a possibility that a body part could be caught between them.	Body parts that get caught can be cut or crushed; loose clothing that gets caught can pull body parts into the mechanism.	Stay away from moving objects. Keep shields in place.
Thrown Object	Blades and other rotating devices can propel objects that come in contact with the spinning blade	Objects that hit people have the potential to bruise, lacerate the skin, or deeply cut flesh.	Wear eye protection around rotating blades. Keep bystanders away
Pull-in Point	Rotating objects that come in close contact with each other.	Rollers can pull a person into the mechanism.	Shut down the machine before making repairs or adjustments.
Burn Point	Heat from hot objects can burn flesh.	Hot mufflers, pipes, and hydraulic fluids can burn a person.	Do not touch the engine or other potentially hot objects. Carefully place your hand near the object to feel if it is warm

Pre-operational tractor checks

A safety “walk around” will identify items around the tractor that need to be addressed before operation. Make sure the tires are not frozen to the ground or stuck in mud. Remove any loose items such as tools laying on the tractor or platform. Check for any obstacles such as toys, large stones, or boards that may be run over if the tractor begins moving. Many of these items cannot be seen from the operator’s seat. It is especially important to make sure no children or other bystanders are present.

Front end loaders

Front end loaders are used quite extensively on many farms to transport feed, gravel, manure, soil, and other items. The heavy load at the front of the tractor alters the centre of gravity and the stability of the vehicle. This can lead to a tractor overturn if the operator does not know how to



correctly compensate for the change in weight distribution. If the loader bucket is too high, unsecured materials in it can fall and injure the driver.

To safely use a front end loader:

- Keep the loader in the lowest position possible while transporting items. This will keep the center of gravity low and is less likely to reduce stability. Consider adding a ballast weight to the rear tires.
- Driving on rough terrains, over obstacles, and on sloped surfaces increases the chance of tipping. When approaching these obstacles, avoid them if possible and slow down.
- The weight in the bucket adds to the momentum of the tractor. When turning a corner this momentum can cause the tractor to tip. Slow down and keep the loader low.
- Evenly distribute the weight within the bucket. An uneven load shifts the center of gravity.
- If the loader is not being used, remove the loader from the tractor. When the loader is attached it reduces visibility and makes it more difficult to maneuver into tight places.
- Do not use the loader as a work platform.
- Never walk under a raised loader bucket.
- Watch for overhead electrical lines when the loader bucket is in the up position. Coming in contact with electrical lines can cause electrocution.
- Always lower the bucket to the ground before parking the tractor. Remember, low and slow

Hydraulic breaks for trailers

The tractor breaks should be in good condition to stop it within desired distance. If the tractor is to be frequently operated with a loader trailer, hydraulic breaks can be fitted on tractor too. The hydraulic brakes of trailer are coupled with tractor near the PTO link. The brake pedal of tractor, when pressed, activates the brakes of tractor as well as trailer.

