



# SAFETY

---

## General Tractor Safety

no. 5.016

by P.D. Ayers<sup>1</sup>

### Quick Facts...

Tractors today are safer than ever, but are still involved in many farm accidents. Overturns are the major cause of tractor-related deaths.

A seat belt and a roll-over protection structure (ROPS) can prevent most overturn deaths.

Safe tractor operations guidelines include: proper servicing, fuel storage and refueling practices; correct speeds; not carrying passengers; proper hitching of implements; turning off engine and/or power take-off when not in use; and keeping all shields and guards in place.

Although today's tractors are the safest ever, they are still involved in many farm accidents. Seat belts, power take-off (PTO) shields, traveling lights and automatic hydraulic oil shut-off are standard on most new tractors. Roll-over protective structures (ROPS), still not standard on all new tractors, are effective in preventing fatalities.

The Occupational Safety and Health Administration (OSHA) requires that employers provide employees with:

- a standard roll-over protection structure,
- a standard seat belt,
- protection from tractor fluid spillage, and
- protection from sharp surfaces.

Annually, 300 to 400 tractor-related deaths occur on U.S. farms. Over 50 percent of tractor-related deaths are caused by tractor roll-overs. A roll bar or roll-over protective structure and seat belt usage could have prevented all of these deaths. Other fatalities include falls, run-overs, crushes and PTO entanglement.

Colorado State University conducted a study of Colorado agriculture-related deaths from 1978 to 1991. The study showed 29 percent of the deaths were tractor related. Of the 50 tractor related deaths reported, 25, or 50 percent, were caused by tractor overturns. A seat belt and a roll-over protection structure could have prevented these deaths.

See fact sheet 5.018, *Tractor Overturn Protection and Prevention*, for additional information on tractor safety.

### Guidelines for Safe Tractor Operations

1. Be sure the tractor is properly serviced. Check lubrication, fuel and water. Check the radiator level when the tractor is cold. If you must check it when hot, use extreme care.
2. Never refuel your tractor while the engine is running. Static electricity, a spark from the ignition system, or a hot exhaust can cause the fuel to ignite. To reduce the static electricity problem, ground the tractor with a ground wire or by dropping mounted equipment so it contacts the ground.
3. Always fuel your tractor outside and store your fuel outside. Store fuel at least 40 feet from any building. Keep the area free of weeds or other burnable material.
4. Carry a first aid kit and approved dry chemical extinguisher. Tractors should have at least a five-pound extinguisher.
5. Be sure of good ventilation before starting the tractor engine. Exhaust gases contain carbon monoxide, which is odorless, colorless and deadly.

**Colorado  
State**  
University

**Extension**

© Colorado State University  
Extension. 7/95. Reviewed 1/05.  
[www.ext.colostate.edu](http://www.ext.colostate.edu)

## **Safety Rules When Using Tractor Attachments**

- *Keep all shields and guards in place. Do not operate equipment with missing shields or guards.*
- *Shut off engine and be sure implement motion has stopped before performing adjustments or maintenance.*
- *For some attachments, use counterweight for stability.*
- *Lift rear-mounted attachments and drive slowly when making sharp turns.*
- *Raise and lower attachments slowly and smoothly.*

6. Keep small children away from tractors. Tractors are designed to carry only one person — the driver. Each year small children are killed by falling from the tractor. Their chance of being killed is just as great when they are allowed to ride on trailing equipment.
7. Keep wheels spread wide whenever possible. A tractor will overturn sideways much more easily if the wheels are close together. When wheels must be moved in for narrow row farming, use extra caution, especially when traveling at higher speeds on roads.
8. Reduce speed before turning. Doubling the speed of a farm tractor quadruples the danger of upsetting sideways. Centrifugal force tries to keep the tractor in a straight line. If you try to turn at a high rate of speed, the tractor will attempt to go straight rather than turn.
9. Reduce speed when using a loader. A loader in the raised position can increase the possibilities of overturns. Keep the loader as close to the ground as possible. Be alert for ditches, rocks or holes that might cause the tractor to overturn. The center of gravity is affected if the load is kept too high in the air.
10. Stop the engine before getting off the tractor. Operators can be killed by a tractor when the tractor has been left running with the operator off the seat, leaving when it has been put in gear, parked, or had the brakes locked.
11. Never hitch to the axle or other high point. Always hitch to the drawbar, take up slack slowly, and never jerk on chains or cables. Broken parts of a chain can act like shrapnel, and a cable can cut the legs from under a person. Nylon ropes have killed tractor operators and bystanders when the rope broke away from an implement. The stored energy in the rope catapults the rope end into the victim. Tractors also can upset backwards when pushing or using a front end loader, or when hitched to the front end by chains or cables that pass under the back axle. Keep the hitch as low as possible, preferably 17 inches. Never get above 21 inches.
12. Be extremely careful when driving up an incline. A tractor can upset if the center of gravity moves behind where the rear wheels are in contact with the ground. Try to back up if it's necessary to get up the incline. If you get caught on a steep incline, back down very slowly and apply the brakes lightly. Weight on the front of the tractor will help.
13. Disengage the power take-off when it's not in use. Use the power shield whenever equipment is in use. If you do not have a PTO shield, make one — it may save your life.
14. Do not wear loose clothing while operating a tractor. Loose clothing can catch on moving parts and cause an accident.
15. Keep the tractor in gear when going down hill. This allows the tractor engine to serve as a brake. In Nebraska, it's unlawful to coast down a hill with the vehicle out of gear. Some tractors may have "free wheeling" in their transmission drive. Make sure this type of transmission is put in direct drive before attempting to use the engine as a brake.
16. Engage the clutch gently, especially when going uphill. "Jackrabbit" starts are dangerous to both the operator and the tractor.
17. Never attach a post or log to the rear wheels when the tractor is stuck in the mud. If the wheels are not free to turn, the tractor can pivot around the axle and upset. Try to back out. If this does not work, get another tractor to pull you out.
18. Follow all traffic rules on open roads. This includes proper lighting, hand signals, right-of-way, etc. Tractors may not use interstate highways.
19. Do not use a tractor for a job it wasn't designed to do. The tractor was designed as a source of power to do field work. It was not designed for chasing cattle, drag racing, or transportation to and from town.

*<sup>1</sup>Colorado State University Extension agricultural engineer and professor, chemical and bioresource engineering. Reviewed by D. Oatman, Extension agriculture agent, Las Animas County.*

Colorado State University, U.S. Department of Agriculture, and Colorado counties cooperating. Extension programs are available to all without discrimination. No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.