



THE TEN COMMANDMENTS OF TRACTOR SAFETY*

Farm Machinery Fact Sheet FM-27

*Reprinted by permission from Kubota Tractor Corporation

On March 26, 1980, a four-year old Nebraska boy was killed when he fell from a tractor driven by his father and was run over by a wheel. The tractor had a cab, but the boy was thrown against the door, tripped the latch, and out he went.

Unfortunately, this was not an isolated case. There are an estimated 800 fatal farm accidents every year and more than 9,000 injuries. Sad to relate, overturns accounted for nearly 50 percent of the tractor fatalities. Even sadder is the fact that the vast majority of them could—and should—have been prevented.

Accidents do not just “happen.” They are caused, which is why they can be prevented. An ounce of prevention is still worth a pound of cure.

Your tractor has been designed and built with your safety in mind. Its safe operation, however, is entirely in your hands. It is a useful and valuable farm machine—not a play thing, not a cow pony, not a rural first cousin to a sports car. It was neither built nor intended for joy riding.

The tragedy of the Nebraska four-year old—and that of thousands of others—could have been prevented. And that’s a very good reason for every tractor owner and operator to read this information carefully and follow its safety rules religiously. The estimated 800 farm tractor deaths a year are 800 too many. It could be cut to near zero. It’s up to you.

Ten Commandments of Tractor Safety

1. Know your tractor, its implements and how they work. Keep your tractor in good condition.
2. Use ROPS and seat belt whenever and wherever applicable. We recommend the use of ROPS (Rollover protective structure) in almost all applications. Most tractor fatalities are caused by overturns. If the tractor is equipped with ROPS, always wear the seat belt.
3. Be familiar with your terrain and drive safely. Use caution on slopes, slow down for all turns and stay off the highway whenever possible. Elementary, but all too often

neglected.

4. Never start an engine in a closed shed or garage. Carbon monoxide is colorless, odorless—and deadly.
5. Always keep your PTO properly shielded. It rotates with the strength of 500 men.
6. Keep your hitches low and always on the drawbar. Otherwise your tractor might flip over backwards.
7. Never jump off a moving tractor or leave it with its engine running. A runaway tractor can be extremely dangerous.
8. Never refuel while the engine is running or hot. And do not add water to radiator while the engine is hot; hot water can erupt and scald.
9. Keep all children off of and away from your tractor and its implements at all times. A tractor's work is not child's play.
10. Never be in a hurry about anything to do with your tractor. Take your time and do it right.

Know Your Tractor—Be thoroughly familiar with both the operator's manual and the tractor itself before starting up the equipment. Know each control, its location and how it works. Know how to stop the tractor and all your attachments quickly in the event of an emergency.

ROPS—Most tractor accidents are overturns (mostly sideways). They are usually caused by high speed or inattention. The development and use of Roll-Over Protective Structures (ROPS) during recent years has saved many lives. They normally will limit the overturn to 90 degrees while at the same time provide a frame of safety for the operator. Seat belts are an integral part of ROPS and should always be used.

ROPS come as either a two- or four-post structure attached to the tractor frame, or as an integral part of a ROPS cab. The ROPS should be replaced any time the tractor has rolled over or the ROPS has had more than a minor impact. If you have any questions consult your dealer.

While ROPS are not always practical in certain situations—as with "low profile" tractors in orchards where vertical clearance is not sufficient—their use is advisable in almost all situations. If the tractor is not equipped with ROPS it should not be operated in a situation where ROPS is recommended. If you have any questions please consult your dealer.

Install Safety Equipment—Outfit your equipment with a fire extinguisher, flares, a first aid kit and small tool kit for minor repairs. But, be sure these items are securely fastened to the tractor.

Safely Decals—Keep safety signs clean and free from obstructing material. Clean them with soap and water followed by drying with cloth. Replace damaged or missing safety signs with new ones from your tractor dealer. If a component with a safety sign affixed is replaced with a

new part, make sure a new safety sign is attached in the same location as the replaced component. Mount new safety signs by applying on clean dry surface and press any bubbles to outside edge.

Dress Properly—Well fitted, belted clothing is a must. Flared pants, shirt tails, scarves and other loose clothing are too easily (and too often) caught in moving parts or controls. Invest in sturdy safety work shoes or boots with non-skid soles and steel toe caps. Protect yourself from the sun in summer and the cold in winter. Heavy work gloves are a plus, as are safety goggles or sun glasses with tempered lenses.

Check the Work Area—Know in advance where hidden ditches, large rocks or stumps are located. Be wary of tall grass—it can cover hazards. Be sure the area is clear of livestock and children.

Who's Your Operator?—Be careful in selecting your tractor operators. A 14-year old with a short attention span and a tendency to be irresponsible is not a good candidate. Be sure your operators read and understand the manual, are familiar with the tractor and are fully aware of their responsibilities. If possible, have young operators take the 4-H or FFA Tractor Program for new operators. Be aware of your own responsibilities under OSHA regulations and local laws relating to tractors and their operation.

Maintenance is a Must—Daily maintenance is the best way to keep your tractor in top running condition. And, a well-maintained tractor is a safer tractor. Maintenance is not something to be put off until tomorrow. Guided by your operator's manual, set up a daily maintenance routine and put it on a checklist sheet for daily use. If there is a youngster around, have him help you. It's a good way to help teach him the fundamentals of maintenance and safety in the world of machinery.

Check hydraulic oil, engine oil and fluid levels, radiator coolant level, brakes and brake fluid, tire pressure, and fan belts. Make sure implements are secure and properly connected. Check, carefully, for hydraulic leaks, using a piece of cardboard or wood rather than your hands. Escaping hydraulic fluid under pressure is capable of penetrating skin, causing serious injury. Follow your operator's manual.

Your tractor uses only diesel fuel. Never use gasoline. And never fuel your tractor while it is running or hot. Turn off the engine and let it cool. Wipe off the area around the fuel cap both before and after fueling. Don't smoke while handling fuel. In fact, it's a good idea not to smoke at any time while you are on or around your tractor.

Start Up—Follow your operator's manual. It contains the safest start-up procedures we can recommend. **DON'T IMPROVISE!**

Never start or run the engine in a shed or garage unless the door is wide open and the area fully ventilated. **CARBON MONOXIDE KILLS!**

Don't start the engine while standing on the ground alongside the tractor. You must be firmly seated, seat belt adjusted (if your tractor is equipped with ROPS), parking brake on, clutch pedal fully depressed, all controls in neutral, immediate area clear of children, pets and livestock.

No Riders—There is only one seat on a tractor—the operator’s. There is no safe place for anyone else, especially a child, either on the tractor itself or on any of its implements. Make it a firm, unbreakable, no-exceptions rule: NO RIDERS!

Engine Running—Before taking off (remember, never be in a hurry), check all the gauges, instruments and warning lights. Test the steering, left and right. Check out the controls and lights. Be sure the implement is in the proper transport position before shifting into gear.

Speed—Always keep in mind that a tractor is a work horse, not a race horse. It MUST be operated at a safe speed. Be especially careful going to and from the field or work area—it’s during that trip that approximately one-fifth of all tractor accidents happen (again, never be in a hurry). To help assure straight line stops when driving at transport speeds, lock brake pedals together.

Hillsides—Use caution on slopes and uneven ground. Drive at a speed slow enough to keep you in complete control of the tractor at all times. Don’t depress the clutch pedal or attempt to shift gears while going down a slope. And if you have to go up a slope, it is best to back up. Make sure that your tractor is properly counterbalanced.

Stormy Weather—In rainy weather, stay alert for holes or ditches hidden under water. Cut your speed to the minimum. If it’s a thunderstorm, stop. Stay away from large trees and get indoors if possible. In icy conditions, use extreme caution. Use tire chains and wheel weights. Again, drive at a speed slow enough to keep you in complete control of the tractor at all times.

The Drawbar Hitch—Hitch only to the drawbar when pulling a load—it’s the only safe place for any kind of hitch. Hitching to the axle or seat bracket can cause the tractor to backflip in less than a second, giving you no time to jump clear. Be sure no loose chains are dangling either from the drawbar or the implement. They can catch on a stump or rock and pull your tractor over backwards in no time.

Power Take-Off—An operating power takeoff (PTO) can be the most dangerous part of your tractor, which is why it comes equipped with protective shields. USE THEM AT ALL TIMES. An unguarded shaft, running at 1000 rpm’s, can wrap your clothes around it at the rate of 8 feet per second, and it can’t be stopped. It is many, many times more powerful than you are. It pays to treat it with the greatest respect.

Safety During Transport—Although tractors were not made for public roads, there are times when such travel cannot be avoided. Before you move your tractor and attachments over public roads, be sure you are familiar with all local regulations. Use an SMV (slow moving vehicle) emblem, proper clearance flags, lights and warning signals. Be sure brake pedals are locked together to assure straight line stops.

Prepare your attachments. Make sure they are secure and properly mounted and that the tractor is properly counter weighted. Carry them in the transport position. Remove or cover sharp attachments. Never operate attachments during transport. Keep the PTO lever in neutral.

Safe driving on the road is a must, and a safe driver is a courteous driver. Pull over and let the normal traffic pass you. This is the law in some states. Be extremely careful at intersections. Remember, your tractor is not capable of jackrabbit starts or quick acceleration to beat a light

(which is not a good practice under the best of circumstances).

Watch your speed. A tractor is designed for easy maneuverability at low speeds, not high speeds. Keep both hands on the wheel and your eyes on the road ahead. A tractor's steering reacts quickly, especially at high speeds. An accidental pull on the wheel can spin you into a ditch or into the path of oncoming traffic in a second's time. According to the National Safety Council, about one-third of all fatal tractor accidents occur on public roads—and high speed is one of the three major causes. The other two are inexperienced operators and any other unsafe operation.

Slow down on turns or curves. A tractor's turning radius is much smaller than that of most automobiles and taking a curve too fast can easily result in an overturn.

Slow down if you are pulling a heavy load on the highway. You have only two brakes, one on each rear wheel, and the load may have no brakes at all. Have the tractor in the same gear going downhill as you would to go up in order to use engine compression for braking.

Know your stopping distance. Always leave room to stop quickly if it becomes necessary.

Never use the differential lock while in transport. It's hard on the rear tires and, at highway speed, can flip you over in a turn.

Most states (about 34) now require that an SMV (slow moving vehicle) emblem be placed on the rear of any tractor or its towed attachment traveling 25 mph or slower. The emblem, a fluorescent yellow-orange triangle with a dark red reflective border, should be centered at between 2 to 6 feet above the ground.

Public road driving should be done in the daytime if at all possible, and during the lightest traffic hours. The best rule is simply not to drive on any public road at night. If it becomes necessary, however, be sure you are completely in compliance with your state and local laws concerning lights—white for the front, red for the rear. There should also be an amber or red light on the farthest projection to the left (i.e., traffic) side, whether, it's the tractor or the attachment. If you have to stop at night pull off the road and set up flares or reflectors.

Stay off the shoulders. If you must drive on the shoulder, cut your speed and keep a sharp eye out for rocks, holes, soft spots and other hazards. Never drive with one wheel on the roadbed and the other on the shoulder.

Shutdown—If you are away from the tractor's home base and have to shut down your tractor for one reason or another, park on level ground. If it is necessary to park on a grade, position the tractor at right angles to the slope. If the tractor is on any kind of grade, block the wheels securely.

When stopping, put the PTO lever in neutral and lower attachments to the ground. Shut off the engine and set the parking brake. Remove the key. Don't jump off the tractor. Use the steps and handholds and watch your step. (The steps should be cleaned regularly and kept free of dirt, grease and oil. A slippery step is a sure invitation to a nasty fall.)

The Tractor and Its Attachments

A tractor without attachments is like a baseball player without a bat—strong and handsome, but rather useless. And, like a bat, every attachment is a potentially dangerous tool to be handled with special care. Refer to the appropriate implement operator's manual for detailed operating and safety instructions.

Carelessness is your worst enemy around a tractor and its attachments. Particular care must be taken when dealing with the PTO. Disengage the PTO and stop the engine when cleaning, servicing, adjusting, repairing, installing or removing an attachment. **NO EXCEPTIONS!**

In General

- ▶ Always keep all shields and guards in place. They are installed for your safety. If shields or guards are missing, especially those designed for the PTO shaft, do not operate the equipment.
- ▶ Always shut off engine and be sure implement motion has stopped before performing adjustments or maintenance.
- ▶ Use counterweights. Some attachments require counterweights at the opposite end of the tractor for stability. Follow your attachments manual and make sure you have the proper weights. If you have any questions consult your local dealer.
- ▶ Lift rear-mounted attachments and drive slowly when making sharp turns.
- ▶ Raise and lower attachment slowly and smoothly especially a loader with a load.

Mower Safety

Inspect the area to be mowed and remove anything that can be propelled by the mower blades. Be alert for any such obstacles.

Avoid operation on steep slopes.

Do not stop or start suddenly when going up or down hill.

Shut off the engine and wait for mower blades to stop before clearing the discharge chute. Disengage the mower and stop the engine before making adjustments or performing maintenance.

Always mow so that discharge is directed away from people, pets or anything that could be damaged by articles thrown from the mower chute.

Mow only in daylight or good artificial light.

Frequently check blade mounting bolts for proper tightness.

If you strike a foreign object, stop the engine and inspect for damage. Repair any damage before restarting.

Snow Blower Safety

Before the first snowfall, clear the areas where the snow removal is to take place, removing large stones, sticks, toys, etc.

Mark such obstacles as driveway markers and water and gas shutoffs so their locations under the snow are obvious.

Adjust the collector housing height to assure clearance above gravel or rock surfaces before operation.

Shut off the engine and wait for attachment blades to stop before clearing the auger or discharge chute. Disengage the attachment and stop the engine before changing the position of the deflector.

Do not clear snow across the face of slopes.

Rotary Tiller Safety

Never stand between the tractor and the tiller when inspecting or adjusting the tiller.

Make sure there is no interference when you lift, back or turn the tiller.

Never operate the tiller if any blade bolts are missing.

If the tractor lunges while tilling a hard surface, immediately step on the clutch and brake pedals. Then shift into a lower gear and resume tilling.

At the end of a work run, always raise the tiller. It could propel the tractor if the blades continue turning in the soil.

Shut off the engine and disengage the tiller before making adjustments or performing maintenance.

Dozer Safety

Travel slowly over rough terrain.

When making turns close to buildings or passing through narrow passages, make sure you have enough clearance.

Be careful to avoid stumps and other immovable obstacles.

Don't use the dozer as a battering ram.

Don't stand with your feet under the blade when changing the angle or removing the blade.

Trencher Safety

Use the trencher only in applications for which it was designed.

Observe underground cable signs and check with local authorities before digging.

Do not dismount during operations and never leave an operating trencher unattended.

Loader Safety

Never walk or work under a raised loader.

Raise and lower loader arms slowly and steadily.

Allow for the extra length of the loader when making turns.

Be careful when handling loose or shiftable loads.

Never move or swing a load when people are in the work area.

Be extremely careful when back filling. The weight of the fill material plus the weight of the tractor and loader could cause new construction to collapse.

Avoid undercutting high banks. If you must do it, watch for such hazards as falling rocks and cave-ins.

Stay away from the outer edge when working along high banks and slopes.

Watch for overhead wire and obstacles when you raise the loader.

Carry load as low to the ground as safety permits and watch for obstructions on the ground.

Backhoe Safety

Avoid sudden starts, excessive speed and sudden stops, especially when operating on a hillside or rough ground.

Never use any hydraulic power of the boom or dipper as a pulling or lifting device.

Never use any part of the backhoe as a tie point for lifting or pulling.

Practice smooth, even transfer of loads. Sudden, jerky movements are dangerous to both equipment and personnel.

Use extreme care when working close to fences or ditches or on hillsides.

Always operate from the operator's seat.

Check clearances before driving under electric lines or before entering a building.

Never move or swing a load when people are in the work area.

Make sure the driver is out of the cab before loading a truck.

Never swing over the truck cab.

Be extremely careful when operating on a slope. Swing to the uphill side if possible. (If downhill dumping is required, swing only as far as necessary to dump the bucket.)

Always move soil a sufficient distance from the trench to avoid cave-ins.

Make sure the tractor is level and not tilted to the slope angle.

Make sure that the tractor is properly counter-weighted.

Conclusion

Safety, in the final analysis, is largely a matter of common sense and patience. Your tractor has been designed and built with your safety in mind. But a tractor is, after all, an inanimate collection of moving parts with no brain. The ultimate responsibility for its safe operation lies with you, the operator.

At the beginning of this fact sheet, we laid down the Ten Commandments of Tractor Safety. Follow them faithfully. If you have any questions, consult your dealer.

Utah State University is an Equal Opportunity/Affirmative Action Institution.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert L. Gilliland, Vice President and Director, Cooperative Extension Service, Utah State University, Logan, Utah. (EP/2-95/DF)