

Tractor Safety Trainer's Notes

(Draft version)

Kirk Lloyd, President, Risk Management Resources, Inc.

These training notes are intended for use in refresher training of experienced tractor operators who are already familiar with the equipment being used. It is NOT adequate for a new operator, or an experienced operator who will be using unfamiliar machinery. For experienced operators who are continuing to use equipment they are already familiar with, the trainer should go over the OSHA rule one section at a time, and provide comments about each section. The OSHA rules appear below in bold italics.

(1) Training. Train all employees who drive an agricultural tractor about the operating practices below and about any other practices peculiar to the work environment. Do this training at the time of initial assignment to driving duties and at least annually after that.

This paragraph includes the critical language “**and about any other practices peculiar to the work environment**” which means the trainer must expand upon the OSHA rules to meet the actual needs of the operators at this farm. This could include hazardous locations on the farm, safety issues with implements and attachments used, and unique features or limitations of particular tractors. Experienced operators can remind each other of the hazards faced in daily operation. A good example would be PTO-operated implements. PTO entanglement is a major agricultural hazard but it's not mentioned in the mandatory training points below because not every farm uses PTO implements. If yours does, that is a practice peculiar to the work environment.

(a) Securely fasten your seat belt if the tractor has a ROPS.

Comments: ROPS stands for Roll Over Protection Structure and ROPS really does work to reduce the risk of injury and death. Old tractors are exempt from the ROPS requirement, but are not exempt from the laws of physics so the trainer must encourage discretion in what they are used for and who operates them. Tractors of any age used in orchards and low-clearance areas can be exempt from the ROPS requirement, but only when the use is related to the low-clearance environment. It would be an OSHA violation to use a ROPS-exempt orchard tractor for haying or another open-field operation. Many newer tractors have a folding ROPS, so it can be put up or down based on the needs at the time. The trainer should emphasize that seat belts must be worn when the bar is up, but should never be used when the bar is down! Cab tractors are another issue. Modern cabs have ROPS protection built into them, but old cabs may not. If it applies, remind the operators which tractors have the protection and which do not.

(b) Where possible, avoid operating the tractor near ditches, embankments, and holes.

Comments: These are generic examples of field hazards that can cause tractors to wreck, either due to the soil caving away or to operator error. The trainer should also review the specific hazardous locations at this farm. The general guideline on edges is to stay back the amount of the depth of the ditch or embankment. (If the ditch is 3 feet deep, stay back 3 feet from the edge.) In the real world, this varies widely based on the type and condition of the soil. This can also become an issue in highway transport operations when the operator pulls over to the edge of the road to let traffic pass. The weight of a tractor has been known to collapse the edge of the road. Be courteous to motorist, but don't feel pressured into pulling off at an unsafe location.

(c) Reduce speed when turning, crossing slopes, and on rough, slick or muddy surfaces.

Comments: Just the act of turning can be enough to roll a tractor at higher speeds. A more common problem is loss of traction on the front wheels, resulting in the tractor not actually going where the operator points it to go. Another speed-related issue is tractor bounce. Because of the large squishy tires and (with rare exceptions) no springs, tractors are prone to bouncing out of control when they hit rough surfaces at higher speeds. Safe speed will vary with implements, attachments, and towed loads too.

Tractors normally have split brakes, with a separate pedal for each back wheel. Using the brake will help with turning. However, this can cause uneven pedal adjustment on some tractors. The operators' manual will normally recommend that the brakes be latched together for highway transport and other use where the split brakes are not needed. Unless the brakes are self-leveling, remind operators of the important of checking the adjustment and keeping the brakes even when the two pedals are latched together.

(d) Stay off slopes that are too steep for safe operation.

Comments: This advice sounds great but it's totally useless unless placed into context. The limits of "too steep" will vary with the tractor (big, small, 2WD, 4WD, Crawler, etc.) and with traction conditions. This is definitely something to include in the "other practices peculiar to the operation" discussion! Remind everyone about the limitations of each tractor they will be using.

Going straight up very steep hills can cause some tractors to back-flip from their own horsepower. Backing up will prevent that. Going straight down steep hills can result in a loss of control if the tires lose traction. The instinctive reaction of then stepping down hard on the brakes will pretty much guarantee a disaster. Speeding up the tractor will sometimes allow the operator to regain control. Crossing slopes carries the risk of rolling sideways, especially during turns when the center of gravity can shift. Depending on the topography of the farm, any or all of these can be included in the discussion.

(e) Watch where you are going, especially at row ends, on roads, and around trees.

Comments: Many tractor-related injuries involve pedestrians rather than the tractor driver! An attitude of “they need to stay out of my way” has no place on a safe farm.

Staying on high alert can be very difficult if the operator is tired or bored. Being a tractor driver is a 24-hour responsibility; the operator must get adequate sleep, good nutrition, and generally be in condition for the work ahead. Even under the best of conditions, operators may find it difficult to stay alert. Stop, get out of the seat, check the tractor and implements, and take a short break. This is much more productive than driving off the end of the field into a canyon.

An emerging problem is related to the use of GPS-based “auto-steer” systems in farm machinery. Operators have so little to do that they literally have allowed their tractors to drive right into objects that the GPS did not recognize.

(f) Do not permit others to ride unless there is a safe seat.

Comments: Riding on tractors is one of those classic “risk taking behaviors” that seems like such a good idea until it’s repeated enough times that a tragedy occurs. It is the tractor driver’s responsibility to prevent unsafe riding. Just say no and refuse to move the tractor if co-worker are riding the machine in unsafe locations.

On family farms, the issue may be the desire of children to ride on tractors with their parents or grandparents. Many youngsters have lost their lives this way, and of course the whole family is devastated by these events.

(g) Operate the tractor smoothly – no jerky turns, starts, or stops.

Comments: Who would have thought that the word “jerky” would appear in the OSHA code? But smooth operation does add life to the tractor and reduces the risk of an accident. Often one of the first places we drive an unfamiliar tractor is out on the highway – which is one of the most dangerous things we ever do with a tractor! When operating an unfamiliar tractor for the first time, get the feel of it in a low-risk location before attempting regular use.

Trainers may also need to discuss changing technology here. For example, we are beginning to see tractors with CVT (Continuously Variable Transmission) systems. New and unfamiliar systems will require even the most experienced operator to read manuals, take instruction, and practice to perfect their skills.

(h) Hitch only to the drawbar and hitch points recommended by the tractor manufacturer.

Comments: It is vitally important for the trainer to be sure that every tractor operator understands the physics of “high hitching”. The critical point to identify is the center of the rear wheels. Any hitch point higher than the center of the rear wheels will tend to pull the front wheels up, potentially resulting in back-flip and a crushed operator. (A hitch point that is lower than the center of the rear wheel will help hold the front end down.) Frequent problem areas include pulling out stuck vehicles, dragging away downed trees, and even shrub removals for landscaping reasons. In many cases, the operator is thinking that the load needs to be moved both up and forward, so the top link of the three-point hitch seems like a good place to attach a chain or cable.

A related situation is the use of hitch bar accessories that go between the lower arms of the three-point hitch. These can often be raised above the critical center point, resulting in loss of traction on the front wheels and reduced steering capability.

Trainers may also need to discuss safety when hitching implements to tractors, as this can be a fairly high-risk activity. Avoid a situation where a worker on the ground is in danger if the tractor operator makes an error or slips off the clutch pedal. This can also be a good time to remind everyone that OSHA required hitch pins to be secured somehow, normally either with pins underneath or a mechanism on top the drawbar that holds the pin in place.

(i) When the tractor is stopped, set brakes securely and secure park lock if available.

Comments: One of the best things an operator can do is avoid parking in a place where the brakes must be relied on to hold the tractor! Whenever possible, park on the level or across the slope. Sometimes it will be necessary to rely on the park system, and there is much variation from tractor to tractor on how to properly secure the machine. Consult the operators’ manual, or get a lesson from someone who already knows. If any tractors at the farm are particularly confusing or unusual in their parking system, discuss those tractors here.

Because we are human and we all make mistakes, operators do sometimes find themselves off their tractor and watching it rolling away down a hill. Trying to jump back on is very dangerous and frequently results in death. In the moment, our instinct may be to try anything necessary to save the tractor. Trainers should emphasize that machines are easy to replace, but humans are irreplaceable and priceless. Owners and managers should make it clear that they value their employees more than anything else. If a tractor is headed for the canyon, just say goodbye and watch it go.

It's not in the OSHA rules but it's a good idea to talk about farm machinery on rural highways:

Comments: This is a complex and emotional subject. When taking farm machinery out on the roadways with the general public, operators will encounter many drivers who are completely ignorant about the limitations of the equipment, some who are openly hostile about it, and perhaps even a few who may engage in "road rage" behaviors.

Trainers should encourage operators to pull over to let motorists pass when they can do so safely. However, sometimes the interests of safety and courtesy may be in conflict. If there is not a good safe place to pull off, don't take a chance on a questionable spot. When preparing to make a left turn, sometimes the best thing to do is drive down the center of the road, effectively closing it against the possibility of someone driving around into a dangerous position. Left turns into a field are one of the more dangerous situations. Sometimes the travel route can be designed to allow a right turn at the final destination.. Remind the operators that hand signals may not be an effective way of communication with all drivers. There are many reports of a tractor operator signaling a left turn by hand, and having the following motorist mis-understand that as a signal to go ahead and pass.

Flashing lights are great visibility tools, but remember that the orange SMV triangle is the REQUIRED symbol on a slow moving vehicle. If an implement or trailer blocks the SMV on the tractor, it's not doing any good. It's best to keep an SMV on all tractors and implements that travel on public roadways, so it's always there when needed

Closing comments.

About half of all agricultural fatalities (and a great many serious disabling injuries) are the result of tractor accidents. Many of the victims are highly experienced operators, so the fact that the operators have survived this long does not guarantee their future safety. Knowledge, good judgment and self-control are critical elements in getting home at the end of each day, as is a properly maintained machine.

At this point, the trainer must again consider whether the "practices peculiar to the work environment" have been adequately covered. If there are items that did not come up during the discussion so far, it is time to add them on to the training here.

Be sure to keep records of all training! The job is not over until the paperwork is done.