

Using tractors safely

A step-by-step guide



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This step-by-step guide to tractor safety is for everyone who uses a tractor, or tractor-operated machinery. It applies to those working in farming, forestry, horticulture, amenity horticulture and the sports turf industry.

Whether you are a student, a regular tractor driver, or an employer, you need to learn about tractor safety before it is too late.

People die in tractor accidents every year and there are many major injuries, including amputations and fractures. There are probably other accidents or near misses which HSE never hears about. Simple but essential safety steps would have prevented most of them.

This leaflet shows how training in tractor safety could save your life.

Step 1 Before starting

Before you start a tractor, you must know the basic safety procedures. These are **safety checks** and **safe stop**.

Safety checks

- Am I wearing suitable clothing and footwear?
- Have I read and understood the instruction manual?
- How am I going to do this work?
- Have I carried out pre-start checks of the machinery?
- Do I know enough to work safely?

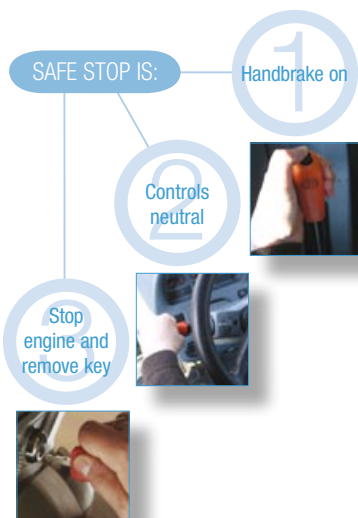
Safe stop

- Make sure the handbrake is fully applied.
- Make sure all controls and equipment are left safe.
- Stop the engine.
- Remove the key.

Always use **safe stop**:

- before leaving your seat; or
- when anyone else approaches; or
- when anyone else is working on the machine.

You need to take extra precautions when **safe stop** is not possible, for example when using power take-off (PTO)-driven stationary machinery such as slurry tankers or operating external controls.



Key points

- Never use a machine unless you are trained and know how to use it safely.
- Make use of relevant training courses such as those run by training providers, agricultural colleges and manufacturers/dealers.
- Never use a machine unless it is properly maintained.
- Keep away from moving machinery – remember that some machine components will continue to rotate or move even after the engine has stopped.
- Wear footwear with a good grip – safety boots are best.
- Wear clothes that will not snag on machinery – preferably overalls.
- Keep long hair tied back.
- Remove any jewellery that might snag – don't forget watches and rings.
- Find and read the operator's manual – keep it handy.



This accident could happen to you . . .

An employee was teaching a casual worker how to drive a tractor during cabbage harvesting. The casual worker had very little experience of driving tractors and was having difficulty engaging the gears. The instructor became impatient, reached into the cab and, while standing alongside the tractor, moved the gear lever. The tractor lurched forward, crushing the instructor beneath the dual wheels.

Training is essential. Never rush it, or leave it until the last minute.

DO NOT FORGET SAFE STOP

It is the most important safety action of all and many lives could be saved by using it.

Step 2 In position

A tractor can only be safely operated from the driving seat. You must know how to get in and get out safely, how to adjust seats and mirrors and how to recognise controls so you are always in control of your tractor.

Some tractors have controls mounted externally to aid hitching (normally on the rear mudguard) – you will need to take different precautions when operating these.

Key points

Getting in and out

- Always use access steps and handholds. Don't jump from the cab.
- Use the nearside cab door whenever you can.
- Keep floors, doors, pedals and your boots clean and mud-free.
- Do not keep tools, drawbar pins or top links on the cab floor.
- Before leaving the seat follow **safe stop**.
- Get out facing inwards so that you have a good grip.
- Never get on or off a moving tractor.

Visibility and seat adjustment

- Before carrying out adjustments ensure the tractor is in **safe stop**.
- Check the seat position – can you operate all controls comfortably?
- Adjust the seat suspension to your weight.
- Make sure mirrors are properly adjusted. When wearing a seat belt, double-check that you can still see clearly.
- Make sure mirrors and windows are clean and give full visibility.

Seat belts

- Seat belts are a legal requirement on all tractors where there is a risk of overturning and it is reasonably practicable to fit one.
- A seat belt will prevent you being thrown out of the cab in an overturn or road accident, where you are most likely to be killed or injured.
- Wear a seat belt when driving on slopes, silage clamps, working on ditch sides and when on public roads.

Controls

- Look in the operator's manual to find out what each control does.
- Make sure you know how the controls are operated.
- Never use any control unless you are correctly seated in the cab.
- Know where the controls should be before you start the tractor.
- Don't forget that different tractors have different controls.
- Never use a machine that you have not been taught how to use.

External controls

- Look in the operator's manual to find out where to stand when using external controls.
- Only use external controls to hitch equipment in accordance with the operator's manual.
- **Do not** place any part of your body in between the tractor and any mounted implement when operating these controls.



This accident could happen to you . . .

The driver of a tractor and loaded grain trailer broke his ribs after being trapped beneath a wheel. He had been standing alongside the tractor to start the engine so that he could tip the trailer. He then reached in to operate the tip control. The handbrake was not fully on and as the grain started to come out of the trailer, the tractor moved forward, trapping him beneath the wheel.

Only start a tractor from the seat. Only operate controls from the correct position.

Step 3 Under power

This step is about getting the engine started and making sure it is safe to begin work. This is the time to check the brakes, the steering and other controls. Also check that no one else is in danger from your tractor.

Key points

- Never drive a tractor or other machinery unless you have been trained to do so.
- Make sure you understand the controls before you operate the tractor.
- Before moving off, always check whether independent brakes are locked together. They should always be locked together for road and transport use.
- Make sure no one else is near before you start the engine.
- Check no one is in danger before you move.
- Check the brakes and steering operate correctly.
- Make sure you know what each control does.



This accident could happen to you . . .

A tractor and potato harvester were being used to harvest early potatoes. Casual workers were employed to work on the harvester. At the end of each row, one of the workers would climb off to pick up fallen potatoes while the harvester turned. As the worker was about to climb back on the harvester, the driver moved forwards without warning, and without checking behind him. The tractor had mirrors, but these were folded against the cab window. The worker was knocked to the ground and crushed to death by the harvester.

Check for danger **every time** you start.

Step 4 Driving

This is not the last step. A safe tractor operator needs many more skills than the steps listed so far. You need to be a competent driver before you can operate tractors and other machinery safely.

Above all, watch out for other people and keep your speed down.

Key points

- Don't drive tractors unless they are properly maintained and safe. Use the operator's manual or Farm Vehicle Health Check Scheme to help you. (See 'Find out more').
- Fix or report defects as soon as possible.
- Take your time and never rush when operating tractors.
- Watch out for obstacles and blind spots.
- Take care with projections such as bale spikes. Remove them or carry them in a safe position both on and off the road.
- Comply with warning signs.
- Remember, other people and children may be around, even if you're not expecting them.

- Equipment, loads, bad weather or bright sunshine make it harder to see, so take care.
- Get help if visibility is reduced, especially when reversing.
- When reversing, use mirrors and horns and any other reversing aids fitted to the tractor.
- Remember, confined or dark buildings and small farmyards make spotting and avoiding dangers difficult.
- Agree safe routes for other tractors and machines to avoid accidents.
- Watch for rear-end swing when travelling with long implements such as ploughs.



This accident could happen to you . . .

A man was using a tractor without a cab to clear out a poultry shed. Although the roof height in the building was not a problem, one of the doorways was very low. The tractor had a folding roll bar so it could pass through the doorway. The driver forgot to lower the frame and drove through the doorway. The tractor knocked out the lintel, which fell onto the driver and crushed his back.

Always take care when driving.

Step 5 Other people

Every time you use a tractor, look out for other people, wherever you are, as other workers are often nearby. Always keep a look out for children.

Key points

If you are an operator:

- Check for bystanders before starting tractors or machines.
- Check where assistants are working and make sure you can see them.
- Agree a way to work safely and make sure everyone follows it.
- Communicate clearly and make sure instructions can be heard and understood.
- Only carry someone else if a proper passenger seat is fitted.
- Use the horn to warn assistants that you are going to start.

If you are helping a tractor operator:

- Agree a way to work safely – and follow it.
- If you are using hand signals, agree their meaning beforehand.
- Make sure the tractor operator can see you.
- Never stand in the line of travel of a tractor or machine.
- Find out the safe places to work or stand when near machines.
- Listen to and follow instructions.
- Do not operate any external controls unless you have been instructed to do so.

If children could be present:

- Never allow them to drive or ride on a tractor – remember, it is illegal to have a child under 13 years old on a tractor, even if a passenger seat is fitted.
- Keep them away from working tractors.
- Always use **safe stop**.
- Always be aware of places where children may be.
- If you see any children, stop work and make sure they move to a safe place.



This accident could happen to you . . .

A tractor driver was travelling along a road with a trailer. He was carrying a passenger who decided to travel on the drawbar of the trailer. He lost his balance and fell from the drawbar. The driver could not stop in time and the trailer wheels ran over his passenger. He died from severe head injuries.

Never carry a passenger on a drawbar or on the back of a tractor. Only carry a passenger in the cab if a seat has been provided for them.

Step 6 Hitching

Accidents are common when hitching or unhitching tractor-mounted machines. To prevent these accidents, remember:

- 1 **Safe stop.**
- 2 Operate controls from the correct position.
- 3 Never forget your assistants are also at risk.

Key points

- Make sure you use the right hitch system.
- Only use controls from the operating position.
- Take extra care when using external controls.
- Never stand between the tractor and other machines, or behind them, unless the tractor is stationary and the driver is aware of your presence.
- Never stand with your feet under, on or near drawbars.
- Ensure that jacks, skids and other supports are used and maintained.
- Communicate clearly if you get help with hitching.



This accident could happen to you . . .

A tractor driver was crushed to death while taking a fertiliser spinner off a tractor. He had not left the spinner high enough to place pallets beneath the machine to support it at the right height. He climbed onto the lower link arm and reached through the cab window to operate the lift control. The empty spinner lifted quickly, and trapped him between the machine and the tractor.

Only use controls from the operating position.

Step 7 Other machines and trailers

Unguarded power take-offs, power take-off shafts, machine blockages and maintenance activities cause many serious injuries.

Correct guarding is essential and you must remember **safe stop** – this is the most important step to make sure you can operate other machinery safely.

Key points

PTO shafts

- Follow **safe stop** whenever possible – it makes sure nothing will move.
- Take extra care when using a PTO-driven machine, eg a slurry tanker, in a stationary position.
- Ensure guards are in place – check they are properly chained, lubricated and free from defects.
- Report any faults immediately.
- Do not use a machine with a damaged PTO shaft guard.
- Ensure the tractor is chocked or that there is a mechanical connection between the tractor and a stationary PTO-driven machine to ensure the tractor or machine does not move, causing the PTO shaft to separate.
- Don't forget to check the PTO is guarded where the PTO shaft attaches to the tractor.

Trailers

- Using tractors and trailers without an adequate braking system has led to loss of control, jackknifing and tractor-overturning incidents.
- Tractors and trailers used on or off the road need to stop safely within a reasonable distance under all conditions.
- Inadequate trailer brakes can lead to accidents when manoeuvring on slopes or slippery surfaces, as the tractor may be pushed sideways and slide out of control.
- If trailer brakes are inadequate (ie are not doing their share of the braking) the tractor braking system can be subjected to excessive wear.
- Safe towing requires the use of a large enough tractor and selecting the most suitable gear to stop the combination within a safe distance.
- Make sure you buy trailers that have a suitable braking system to match your tractor and ask the supplier for brake efficiency information.
- Failsafe trailer braking provides emergency brakes if the tractor stalls, or if the tractor and trailer become unintentionally detached.

Maintaining trailer brakes

- Properly maintain and adjust braking systems for tractor-trailer combinations to ensure efficiency and safety. Testing on the move may be necessary after maintenance.
- Keep hydraulic and air brake couplings clean and avoid contamination.
- Make sure linkages are properly lubricated and operate freely and keep them maintained.
- Check the parking brake works properly – they are prone to seizure if neglected.
- After use, clean mud and contamination from brakes (including parking brakes). Make sure the cleaning method does not lead to deterioration of the brakes (eg rusting caused by pressure washing).

- Tractors which are not fitted with a self-balancing braking system require more frequent checks to make sure the brakes are evenly balanced.
- Follow the manufacturer's recommendations for frequency and detail of inspection.
- Some older brake linings may contain asbestos. Take appropriate precautions to avoid breathing dust and when disposing of waste material.
- Make sure operators are familiar with the operation of air brake systems (if fitted) so they know how to attach and detach trailers safely.

Other machinery

- Check the machine is properly guarded and the guards have no defects.
- Check the machine for defects.
- Check the brakes are connected.
- Make sure you are trained and competent to use the machine.
- Always use **safe stop**.
- Don't use the machine unless it is properly maintained.
- Always lower machines to a safe position before leaving the seat.



This accident could happen to you . . .

A tractor driver was picking up silage with a trailed forage harvester when it became blocked. He got off the machine to try and clear the blockage. He did not stop the engine or the PTO drive. As he removed a guard the rotor hit his arm and ripped it off. He died from loss of blood.

Always follow **safe stop** before clearing a blockage.

Step 8 Overhead electricity power lines

Overhead electricity power lines (OHPL) exist on many farms. This step is about dealing with the dangers they present.

Key points

- Contact with any OHPL can kill, so plan to avoid working near them if possible.
- Be aware of minimum line heights and the maximum height/reach of tractors and machines passing below or near OHPLs.
- Get OHPLs checked by your distribution network operator if you have doubts about their height.
- Check that lines are marked on the farm map and pass on this information to contractors and other visitors that need to know where the lines are.
- Consider the height and reach of machinery when buying or hiring replacements.
- Use alternative access points and routes to avoid the lines.
- Look out for warning signs, barriers, posts and warning tapes.
- Always provide and use safe tipping areas away from OHPLs.
- Find out ways of reducing the risk of contact with OHPLs (see 'Find out more').



This accident could happen to you . . .

A tractor driver was electrocuted after his tipping trailer touched an 11 000 volt overhead power line. He had been carting manure to a heap which was near the power line. He tipped the trailer and pulled forward to empty the load. The 6.75 m trailer touched the 6.5 m high power line. He was electrocuted when he got out of the tractor.

Keep clamps, manure heaps and bale stacks away from power lines.

Step 9 Overturning

A tractor can overturn anywhere – on silage clamps, near field drains and even on the flat. Most overturns happen on slopes. You must know and recognise the dangers of slopes.

Accidents happen because drivers misjudge slopes, ignore changing ground conditions and forget the effect of loads on stability – do not drive on slopes until you are properly trained.

Key points

- Remember, overturning can happen on flat ground as well as on slopes.
- Remember, although a tractor can be driven up a slope with a hard surface, it cannot necessarily come down the same slope safely.
- Always couple and use trailer and trailed equipment brakes.
- Use seat belts if they are fitted. If they are not, get them fitted. You are at risk even if you have a cab.
- Make sure a safety cab is fitted – or a roll frame on older tractors (in which case a seat belt must be fitted and used).
- In the event of an overturn stay in the cab – do not attempt to jump out.
- If in doubt, walk the ground before driving over it to check for hollows, hidden logs, tree stumps, rock outcrops, rabbit holes etc.
- **Get yourself trained in slope safety.**

A safe working system

- Always plan work in advance so that the work methods are safe at all stages.
- Drive slowly where the ground surface is not easily seen, eg in long grass, bracken etc.
- Ensure you use a large enough tractor for the machine or trailer you are using, taking account of the weight of the machine, trailer and any load.

Driving across and turning on slopes

- Always descend straight down the gentlest possible gradient of a slope, rather than driving diagonally across it.
- Avoid working across slopes if your tractor has large diameter, tubeless, low-ground-pressure tyres.
- Avoid turning down a slope – this is especially hazardous.

- Plan work across slopes so that turns are made uphill rather than downhill.
- Use the widest practicable wheel track setting to reduce the likelihood of the tractor overturning.

Turning with rear-mounted equipment on a slope

- Add enough front ballast to counterbalance rear-mounted equipment, particularly when working on slopes. But remember, using such ballast may reduce safety when travelling downhill.
- Remember, when using rear-mounted fertiliser spreaders or sprayers the tractor rear-wheel grip reduces as the load is discharged.
- Remember, the steady weight reduction reduces traction and increases the possibility of sliding, especially when coming down the slope.
- The higher the mounted equipment is on the tractor's rear linkage, the less stable the tractor becomes. Keep mounted equipment as low as possible (within the constraints of effective use).
- Select the correct gear for the ground conditions and turn slowly, so that the tractor is under complete control during the manoeuvre.

Tractor with raised load on the front end

- Ensure enough ballast weight is fitted to the rear.
- Make sure the loader is not overloaded (consult the manufacturer's handbook).
- Whenever possible, lower the loader for travel.
- Do not drive at speed, make abrupt turns, or suddenly stop with the loader raised.
- Plan fore-end loader work to minimise travel with the loader raised.



This accident could happen to you . . .

A farmer was spreading fertiliser with a mounted distributor on fairly steep land that he was familiar with. He was travelling uphill when the tractor overturned rearwards and he was thrown from the cab and crushed. The tractor had been fitted with dual wheels to prevent sideways overturn, but had no ballast on the front, which would have reduced the risk of rearwards overturn when travelling uphill.

Make sure you use ballast to provide traction and stability where necessary and are aware of the effects of changes in weight distribution.

Rearward overturns

A tractor with its rear wheels turning at only 2 mph will be vertical in 1 second if the object it is pulling resists movement. An inexperienced driver may need as much as 1.5 seconds to decide on and carry out remedial action.

Vertical jackknifing of tractor and trailer combination

- Ensure trailers are not overloaded and the load is evenly distributed.
- When tipping take care to ensure the load slides freely from the trailer.
- Adding rear ballast (eg wheel weights or water ballast) will increase the stability of the tractor.
- Pick-up hitch hooks and trailer eyes should be free from wear that may result in unhitching, especially when tipping.

Hitching chains or tow ropes

- Always hitch **as low as possible**.
- Never hitch above the axle.
- A chain or tow rope hitched too high could cause rearward overturn of the towing tractor even on level ground.

Freeing a bogged-down tractor

- If the tractor becomes bogged down, try to reverse out. If this fails you will need help.
- Never chain the wheels or jam them with blocks of wood. They may be forced into the ground and the tractor may overturn rearwards.

Winching with tractor-mounted winches

- To avoid overturning the tractor during winching, always see that it is set straight in line with the pull.

Clutch use

- Select the correct gear at the beginning of the slope, so there is no need to change gear on the slope.
- Engage four-wheel drive (if available) before working on slopes.
- Suddenly engaging the clutch can cause a rearward overturn.
- Let the clutch in slowly and avoid snatching. This is particularly important when driving up slopes.
- Keep the pedals, footwear and tractor floor/footplates as dry and free from mud as possible.
- Be aware that electrohydraulically operated clutches may engage more suddenly than mechanically operated clutches.



Parking

- Before dismounting, stop the tractor engine and apply the parking brake fully.
- Do not park with a heavy load on a steep slope.
- Remember, parking brakes may have a lower capability than service brakes, and some transmission systems provide no engine braking when the engine is stopped.
- Try to park on level ground, especially when loading and unloading.
- Use the transmission parking brake if fitted.

Driving near a ditch or bank

- Keep away from banks and ditches, especially when turning.
- If you cannot avoid driving near to ditches or banks take extreme care, particularly where the surface is loose or wet or where the edge is concealed by undergrowth.
- Make headlands wide enough for safe turning.

Using a tractor to stack or consolidate silage

- **This is a job for the experienced driver only.**
- Ensure the sides of the clamp are properly supported and fitted with sight lines.
- Keep away from the edges and ensure the clamp is made properly.
- Select a tractor that is suitable for the job.
- Avoid using a tractor that is not fitted with an approved safety cab.
- Be aware of soft spots and hollows that may affect stability.

Using a tractor to push slurry

- If you scrape manure or slurry over a ramp into a lagoon or pit, check that a suitable barrier is provided to stop the tractor passing over the end.
- Keep your speed down.
- Ensure the scraper tractor is properly maintained, particularly the brakes.



This accident could happen to you . . .

A well-maintained four-wheel-drive tractor was being driven down a 1 in 4 grassland slope which had recently thawed. The driver had not assessed the ground conditions properly, and arrived at a frozen part of the slope. The tractor slid for 50 m, gaining speed, then bounced and rolled over, throwing the driver through one of the doors, breaking his leg. No one found him until nine hours later.

Make sure you assess slope conditions as they can change from day to day. Always wear a seat belt when working on slopes.

Find out more

The Farm Vehicle Health Check scheme is a cross-industry initiative that can help farmers to manage vehicle maintenance. It provides a structured checklist for essential items and can be used to record that checks have been made:

www.nfonline.com/Our-work/Farm-safety/Guidance/Farm-Vehicle-Health-Check-Scheme/

Operator seat restraints for mobile work equipment in agriculture and forestry Agriculture Information Sheet AIS37(rev1) HSE Books 2012 www.hse.gov.uk/pubns/ais37.htm

Power take-offs and power take-off drive shafts Agriculture Information Sheet AIS40 HSE Books 2013 www.hse.gov.uk/pubns/ais40.htm

Safe use of big round balers Agriculture Information Sheet AIS4(rev1) HSE Books 2011 www.hse.gov.uk/pubns/ais4.htm

Working safely near overhead electricity power lines Agriculture Information Sheet AIS8(rev3) HSE Books 2012 www.hse.gov.uk/pubns/ais8.htm

Safe use of potato harvesters Agriculture Information Sheet AIS13(rev1) HSE Books 2012 www.hse.gov.uk/pubns/ais13.htm

Safe use of forage harvesters Agriculture Information Sheet AIS24 HSE Books 1998 www.hse.gov.uk/pubns/ais24.htm

Safe working with bales in agriculture Leaflet INDG125(rev3) HSE Books 2012 www.hse.gov.uk/pubns/indg125.htm

Vehicle safety on farms DVD HSE Books 2007 ISBN 978 0 7176 6252 4 £30 incl VAT A compilation of five HSE training films about safety with farm vehicles

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

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