# Prepare and operate a tractor with attachments

Note: This section is in two parts

## Prepare a tractor with attachments for operation

### CONTENTS

<table>
<thead>
<tr>
<th>Part 1</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation</td>
<td>2</td>
</tr>
<tr>
<td>Safe stop</td>
<td>3</td>
</tr>
<tr>
<td>Safety checks</td>
<td>3</td>
</tr>
<tr>
<td>Before starting</td>
<td>3</td>
</tr>
<tr>
<td>Getting in and out</td>
<td>4</td>
</tr>
<tr>
<td>Seats and mirrors</td>
<td>4</td>
</tr>
<tr>
<td>Instruments and controls</td>
<td>4</td>
</tr>
<tr>
<td>Attachments</td>
<td>5-9</td>
</tr>
<tr>
<td>Warning signals and dangers</td>
<td>10-11</td>
</tr>
</tbody>
</table>
PART 1

Prepare a tractor with attachments for operation

Legislation

Most accidents occur while using machinery. Tractors and attachments are one of the most frequently used pieces of equipment. Proper training in safe use is a legal requirement and is the best way to prevent accidents. For more details on legal requirements see handout ‘Monitor and maintain health and safety’.

Reference: HSE Booklet "Tractor Action" (IND(G) 185L)
Safe stop

You must learn to use "Safe Start and Safe Stop" procedures at all times.

A) Safe Stop is probably the most important safety action of all.

This involves:

a) Making sure the handbrake is on.
b) Making sure all controls and equipment are left safe.
c) Stopping the engine; and
d) Removing the key.

B) Always use Safe Stop

a) Before leaving the seat; or
b) When anyone else approaches; or

When anyone else is working on the machine.

Safety checks

Safety Checks are about making sure the tractor operator is properly prepared. The trainees should always ask themselves:

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

Before starting

a) Wear footwear with a good grip – safety boots are best.
b) Wear clothes that will not snag on machinery – preferably overalls.
c) Keep long hair tied back.
d) Remove any jewellery, which might snag – do not forget watches and rings.
e) Find and read the operator’s manual – keep it handy.
f) Do not use a machine unless you are trained and know how to use it safely.
g) Do not use a machine unless it is well maintained.
Getting in and out

a) Always use access steps and handholds.
b) Use the nearside cab door whenever you can.
c) Keep floors, doors, pedals and your boots clean and mud-free.
d) Do not keep tools, drawbar pins or top links on the cab floor.
e) Before leaving the seat follow SAFE STOP.
f) Get out facing inwards so that you have a good grip.
g) Never get into, or out of, a moving tractor.

Seats and mirrors

a) Before carrying out adjustments ensure the tractor is in SAFE STOP.
b) Check the seat position – can you operate all controls comfortably?
c) Adjust the seat suspension to your weight.
d) Make sure mirrors are properly adjusted.
e) Make sure mirrors and windows are clean and give full visibility.
f) Use the seat belt if one is fitted.

Instruments and controls

a) Look in the operator’s manual to find out what each instrument and control does.
b) Make sure you know how the controls are operated.
c) Never use any control unless you are correctly seated in the cab.
d) Know where the controls should be before you start the tractor.
e) Know what all warning lights and instruments mean.
f) Do not forget that different tractors have different instruments and controls.
g) Never use a machine that you are unfamiliar with.

Before starting the engine check the following:

- That the handbrake is applied.
- The brake pedals are locked together.
- The transmission is in neutral.
- The clutch is depressed.
- PTO is in neutral.
- The hydraulic system is safe.
Attachments

A) Hitching

a) Make sure you use the correct hitch system.
b) Only use controls from the operating position.
c) Never stand between the tractor and other machines, or behind them.
d) Never stand with feet under, on or near drawbars.
e) Ensure that jacks, skids and other supports are used and maintained.
f) Communicate clearly if you get help with hitching.

B) Drawbar

The drawbar is used for towing implements such as trailers.

a) Only pull from the drawbar.
b) Pull away slowly.
c) Keep brakes in tandem while towing.
d) Use proper drawbar pins with locking pins to connect the tractor and implements.
e) Remember to plug in other related attachments if relevant. These could be electrical, hydraulic or brake connections. If used, ensure the pipes and cables are clear of the ground and will not snag drawbars or three-point linkage.
The drawbar should be used in the correct configuration for the type of implement or trailer being towed (see diagram) failure to do this may cause the drawbar pin to bend or break when travelling over undulating ground.

Correct

Incorrect

The drawbar may also be adjusted for length, which may be particularly important when using:

- Drawbar attached PTO driven equipment. Always check in the instruction book for the equipment to see if it recommends a drawbar length. If no recommendation is given generally acceptable dimensions are shown in the diagram (a) below.

(a)

- When attaching trailers, the drawbar should be kept as short as possible, to prevent it from overloading the drawbar due to the downward force of the trailer, (see also the information on the use of pick-up hitches). However care should always be taken not to make contact between the trailer/implement drawbar and the tractor tyres or link arms.

Pick-up hitch

Many modern tractors are fitted with pick-up hitches. These enable heavy trailers to be attached without any manual lifting or the use of jacks and without leaving the driver's seat. The system operates from the rear linkage of the tractor and has a mechanical lock, to secure the hitch without putting excessive loads on the hydraulic system.

1. Hitch pin or hook
2. Locking support hooks
3. Hitch

Pick-up hitches should only be used with a trailer/implement with a "ring" hitch.
C) Three point hitch

![Diagram of three point hitch](image)

a) Parts explained

i. Lower links: These provide the 2 lower attachment points to the implement.

ii. Check chains with turnbuckle: These are tightened up to prevent sideways movement of the implement.

iii. Lift rods: These hydraulically lift the lower links and the implement. The right rod is manually adjustable in length.

iv. Top link: The third attachment point to the implement. It is manually adjustable in length and adjusts the angle the implement sits at.

b) Safe 3-point hitching

i. Use 3-point hitch only with equipment designed for 3-point hitch usage.

Hitch pins on implements have two sizes:

- Category 1 small size fitted to most compact tractor implements.
- Category 2 fitted to larger implements suitable for larger tractors.

It is essential that the correct size of pin and ball is available to match different tractors and implements; this may be done by changing the linkage arm balls (larger tractors) or using specially designed spacers.

ii. When using a 3-point hitch mounted implement, be sure to install the proper counter balance weight on the front of the tractor.

iii. When transporting on the road, set the implement lowering control in the 'lock' position to hold the implement in the raised position.

c) Attachment procedure is as follows

i. Back the tractor up to the implement, aligning the lower link ball ends with the implement hitch pins and apply the safe stop procedure.
ii. Push the hitch pin through the ball and secure it with the linch-pin.

iii. Attach the right hand lower link to the implement, using the levelling lever to adjust the height of the link if necessary.

iv. Attach the top link to the implement “A” frame and to the top link attachment point on the tractor.

v. Level the implement from side to side (using the right hand levelling link) and front to back (using the top link).

vi. Adjust the check chains or stabilisers to minimise side swing on the implement.

d) Detachment of mounted implements

i. Select a level area, as this will make detaching much easier.

ii. Lower the implement. Where necessary, fix parking stands in position.

iii. Use safe STOP procedure.

iv. Dismount from the tractor, disconnect the implement end of the top link.

v. Detach the lower links, replacing the linch-pins to avoid losing them.

D) Power Take Off (PTO)

The PTO is used to power machinery. When treated with respect and training and maintenance are adhered to, the PTO can be used safely.

a) PTO guards

All power take off shafts should be shielded and covered when not in use (diagram i).

The actual shaft should only be uncovered when the SAFE STOP procedure has been applied, and then be connected to the shaft as soon as possible (diagram ii).
The PTO shaft must also be fully guarded and have anti-rotation chains which attach to the "U" guard on the tractor and on the machine to prevent the guard turning.

An unguarded shaft or damaged guard can snag hair, clothing or jewellery and in a split second, you can be seriously injured or dead.

b) Be safe

**PTO shafts**

i. Follow SAFE STOP – it makes sure nothing will move.

ii. Ensure that guards are in place – check they are properly chained and lubricated.

iii. Report any faults immediately.

iv. Do not use a machine with a damaged PTO shaft guard.

c) Operating the PTO

i. Wait until all moving components have completely stopped before getting off the tractor, connecting, disconnecting, adjusting, cleaning, or servicing any PTO driven equipment.

ii. Keep the PTO shaft guard in place at all times. Replace the PTO shaft cap when the shaft is not in use.

iii. Before installing or using PTO driven equipment, read the manufacturers’ manual and review the safety labels attached to the equipment.

iv. To prevent PTO driven equipment from running at excessive speed, use the standard 540 rev/min speed, a range of other speeds are available on some tractors. Always check carefully for the correct operating speed for the machine before using any of them.

v. When operating stationary PTO driven equipment, always apply the tractor parking brake and place chocks behind and in front of the rear wheels. Stay clear of all rotating parts.
Warning signals and dangers

Other people are most at risk when tractors and machinery are working in public areas. Always think about their safety when reversing or approaching blind spots. It may be necessary to use a banksman as a lookout.

A) Always observe and obey warning signs.

B) Be aware of:
   a) Bad weather.
   b) Wet surfaces.
   c) Overhead power lines.
      i. Contact with any overhead power line can kill.
      ii. Find out ways of reducing the risk of contact with overhead power lines.
      iii. Check that lines are marked on any maps.
      iv. Be aware of the height and reach of machinery.
      v. Use alternative access points and routes to avoid the lines.
      vi. Look out for warning signs, barriers, posts and warning tapes.
      vii. Always use safe tipping areas.
   d) Overturning
      i. Remember, overturning can happen on flat ground as well as slopes.
      ii. Match the equipment to the tractor.
      iii. Always couple and use implement brakes.
      iv. Keep all machines well maintained.
      v. Use seat belts if they are fitted – if not, get one fitted.
      vi. Make sure a safety cab is fitted.
      vii. Get yourself trained in slope safety.

C) Drive safely
   a) Do not drive tractors unless they are well maintained.
   b) Take your time and never rush when operating tractors.
   c) Watch out for other people, obstacles and blind spots.
   d) Look out for warning signs.
   e) Remember, other people may be around – even if you are not expecting them.
   f) Equipment, loads or weather make it harder to see – take care.
   g) Get help if visibility is reduced, especially when reversing.
   h) When reversing, use mirrors and horns.

D) If you are an operator
   a) Check for bystanders before starting tractors or machines.
   b) Check where assistants are working – make sure you can see them.
   c) Agree a way to work safely – make sure everyone follows it.
   d) Communicate clearly – make sure instructions can be heard and understood.
   e) Only carry someone else if a proper seat is fitted.
   f) Use the horn to warn assistants that you are going to start.
E) If you are helping a tractor operator
   a) Agree a way to work safely – and follow it.
   b) Make sure the tractor operator can see you.
   c) Never stand in the line of travel of a tractor or machine.
   d) Find out the safe places to work or stand when near machines.
   e) Listen to instructions.

F) If children are present:
   a) Never allow them to ride on a tractor.
   b) Keep them away from working tractors.
   c) Always use SAFE STOP.
   d) Always be aware of places where they may be.