

# Agricultural Tractors—Safe Operation

## References

Further information is contained in:

- Health and Safety in Employment Act 1992.
- Health and Safety in Employment Regulations 1995.
- *Guidelines for the Provision of Safety, Health and Accommodation in Agriculture*, available from OSH.
- *Farm Health and Safety Manual*, available from Federated Farmers.
- *Basic Tractor Skills*, available from ACC.
- *Advanced Tractor Skills*, available from ACC.
- *Critical Factors Chart*, available from OSH. (A guide for farmers to manage hazards in the workplace).

## Assess a Person's Skill Level to Operate a Tractor

One of the best methods to assess the skill level of a person to operate a tractor is to spend time discussing aspects of safe tractor operation from your experience and getting the operator to demonstrate their skill while under your direct supervision.

When learning to drive a tractor, it is advisable to select an area of flat ground free of obstacles and hazards. After ensuring that the operator is familiar with the controls, initial driving should involve the use of the gears and taking time to get used to the controls, in particular the throttle, brakes and clutch. Gear changes need to be practised so that changes are made smoothly because, under difficult conditions, an ability to change gears quickly and smoothly and correct gear selection is very important.

Familiarisation with the tractor should include: tractor components; controls; gears; start/stop procedures; layout and function of controls.

Identify potential hazards such as speed, obstacles, surfaces, slopes undulations/ruts as well as routes to be taken, terrain peculiarities and alternative routes that can be used in bad weather conditions. Use this time to familiarise the operator with your property. The operator should be able to

manoeuvre the tractor in a controlled manner using correct gear selection and able to drive through a range of surface conditions.

## Assess Tractor Limitations

Follow the manufacturer's recommendations for operating your tractor. This information is usually included in the operator's manual for newer tractors, for older models with no manual, contact your local tractor dealer for assistance.

Tractors perform many different tasks on the farm, more often than not with an attachment or implement. Various forces are exerted on the tractor affecting the overall handling while completing these tasks.

Centrifugal force is one of the major causes in tractor overturns. Slow down before making any turn. The centrifugal force tries to keep the tractor going in a straight line. Doubling the speed of a tractor while turning increases the chance of overturning by four times.

## Implements and Their Effects on a Tractor

Fit implements according to the manufacturer's instructions.

Always use the draw bar or the manufacturer's mounting points for the attachment of equipment.

Selecting a safe hitch where traction is a priority—demanding a reasonably high hitch point at the rear of the tractor—will require a trade off between getting sufficient weight transfer to optimise traction and not getting so much weight transfer as to cause a flip-over. Where traction is a priority, make sure you use a long draw bar.

Never use the top link as a hitch point.

Always use the correct size draw bar pin with a lynch pin through the bottom of it.

Never fix a single clevis tow bar to a single clevis draw bar—one must have a double clevis.

## Environmental Conditions

Loss of traction is one of the single most common starting points of all tractor accidents.

Tractor tyres with tread bars at 45° have more lateral (sideways) traction on hills than tread bars at 22-23°.

On sand or pumice soils, interchanging the wheels so the tread bars are reversed, may increase traction by holding the soil together instead of pushing it out sideways as a means of self-cleaning. This does not apply on normal soils.

Under-inflation of tyres on soft ground may increase traction. Over-inflation will seldom increase traction on any surface.

## Terrain

- A tractor's stability is greatly reduced on steep slopes.
- Avoid quick uphill turns.
- Watch for holes and depressions on the downhill side and for bumps on the uphill side.
- Keep side-mounted equipment uphill of the tractor.
- Set your tractor wheels to the widest possible setting to increase stability when working on hill sides.
- Descend slopes cautiously keep the tractor in low gear and allow the motor compression to act as a brake.
- When operating near ditches, holes, gullies and washouts or rivers stay as far away as they are deep.

## Vehicle Maintenance

Features which should be checked on a regular basis include:

*Brakes* — lubricate linkages and adjust brakes evenly on both sides.

*Tyres* — check air pressure, water content, damage, wear also check tightness of wheel nuts.

*Hydraulics* — lubricate linkages and ensure oil level adequate and check for leaks.

*Battery* — top-up, keep fully charged.

*Steering* — lubricate and check linkage nuts.

Daily checks on: fuel, water, engine and transmission oil.

## Passengers on Tractors

Having regard to the Machinery Act 1950 definition for a tractor, and taking into consideration the requirements set down in the Health and Safety in Employment Regulations 1995, with particular reference to sections 57, 60 and 61, it would appear that the intent of the legislation is to preclude the carrying of passengers on a tractor.

Where training is being carried out, means should be provided to ensure that the trainer/ passenger has adequate seating and handholds to minimise the risk of falling from the tractor. In general passengers should not be carried on tractors unless a purpose-built facility for carrying passengers has been provided.

## Age of Tractor Driver

Under the requirements of the HSE Regulations, youths under the age of 15 years are not permitted to drive any vehicle or

ride on any vehicle while it is towing an implement, nor any vehicle while any implement is attached.

However, the regulations make provision for youths over the age of 12 who are not employees to drive a tractor, in connection with agricultural work, if the youths have been fully trained or are being trained in the safe operation of the tractor and implement being drawn by the tractor.

## Tractor Safety Frames, Seat Belts and Guards

Regulations covering the design, manufacture, testing and repair of tractor safety frames were in draft form at the time of publication of this bulletin.

### Safety Frames

Safety frames approved by a designated institute will be required to be fitted to all tractors used or sold or hired for use in agricultural operations (except for certain operations). Tractors manufactured prior to 1 June 1967 will be exempt. Tractors weighing less than 762 kg or more than 4 tonnes will also be exempt.

### Seat Belts

Seat belts on tractors increase operator security when operating on steep or rough ground. The operator maintains better control of the tractor and is prevented from being thrown off, even when the tractor is bouncing but not in danger of overturning. Assessment of terrain that the tractor will be operating on should assist in the decision to wear a seat belt.

Seat belts are not compulsory on tractors in New Zealand.

Tractors are generally noisy machines. Unless you have a well insulated cab, you are at risk from hearing loss due to noise exposure particularly when operating the tractor for extended periods. Wear suitable ear plugs or ear muffs.

PTO shafts — fit a guard over the full length of the PTO shaft and universal. The cover, if fitted correctly, should remain stationary while the shaft turns inside it.

## Have You Assessed the Critical Factors for Tractors on the Critical Factors Chart?

- Assessment of operator's skill level
- Vehicle limitations given task
- Implements and their effect on vehicle
- Environmental conditions
- Terrain
- Vehicle maintenance level
- Age of tractor driver
- Passengers on tractors
- Safety frame/seat belts/guards.