

Plant – Mini loaders overturning

What is the problem?

In some situations mini loaders can become unstable and overturn, crushing the operator. If the mini loader bucks, the operator can be thrown and sustain injuries. Operating on sloping ground, operating the controls suddenly, raising the bucket on an upslope or

unbalanced loads due to a full bucket can cause the loader to buck or overturn. Mini loaders weigh hundreds of kilograms and once they start to overturn, there is little chance of stopping this movement.

Below are some common problem situations.
(continued overleaf)

/// The Problem



Figure 1
With an empty bucket, the weight of an operator may lift the front wheels in some situations. Raising the load on an up-slope brings the weight of the loader back towards the rear wheels. Raising the load fully or even having a heavy operator on the back may cause the front wheels to lift.



Figure 2
When on a slope, a bump under the front wheels or a hole under the back wheels will increase the angle of the loader and will move the weight towards the rear. This may be sufficient to tip the loader when at this excessive angle.



Figure 3
Movement across slopes increases the chances of tipping sideways. The angle of a slope may be difficult to find out unless it is measured.

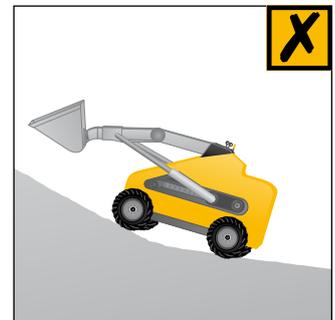


Figure 4
When moving from a shallow slope to a steeper one, the operator may underestimate the final angle.



Figure 5
When moving onto a slope from flat ground, the operator will have to lift the bucket so that it doesn't dig in. The minimum amount the bucket needs to be lifted will be difficult to determine and may be more than the safe maximum allowed when all wheels are on the slope.

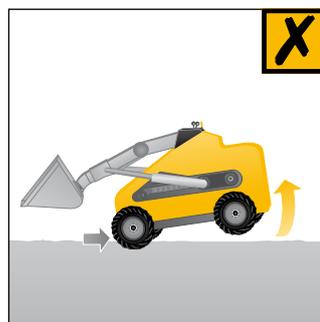


Figure 6
Operating wheel controls suddenly may cause the loader to buck even if on flat ground. On sloping ground, this sudden lifting of one end of the plant may be enough to cause overturning.



Figure 7
Sudden movement of the control of one side will turn the loader fast and throw the operator sideways. If the control of one side is suddenly released whilst the other side is still held, the wheels on the released side will stop suddenly and the person can be thrown towards the moving side.

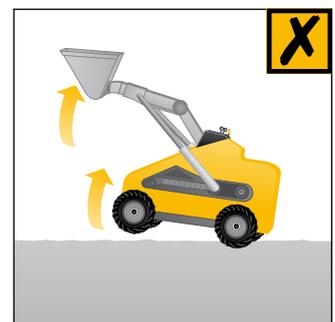


Figure 8
Sudden stopping of upward bucket movement can make the loader buck, and on a slope this movement can be enough to overturn the loader.

The information is general and discusses wheeled loaders with buckets. However, tracked loaders and fitting other attachments have many of the same limitations.

It is also important to note that tracked loaders may be able to climb to a greater angle than wheeled loaders. Walk-behind loaders don't rely on the operator's weight, but overturning can still occur if the above situations aren't controlled.

What are the risks?

An unstable loader may overturn and crush the operator or the operator may be flipped from the footplate and sustain impact injuries. Bystanders can also be at risk of crush or impact injuries if they are close by when overturning occurs.

What are the solutions to the problem?

- Read and follow the manufacturer's instructions to find out the maximum allowed slope for the particular loader in both the front-to-back and side-to-side directions.
- Find out which end of the loader is heaviest without any attachment, for all attachments being used and for the weight of all people who will operate the loader, with or without attachments. Consider both with added load and no load situations.
- Always carry a load as close as possible to the ground.
- Have the heavier end of the loader higher up the slope and do not turn on slopes.
- Don't borrow attachments from other loader brands without confirming with the manufacturer of the loader that its balance will not be changed.
- Measure the slope of the area you are working on, including any side slopes, and barricade off any areas that exceed the maximum allowable slope.
- Beware of creating any ramp that exceeds the maximum allowed slope for the loader.
- Keep the area being moved over clear of dropped material that may lift a wheel – fill any holes, ditches, soft ground and any other surface condition that may allow a wheel to drop.
- Avoid sudden control movements, including letting go of self-centring levers or combined movements of controls, such as raising the bucket while starting forward movement.
- Operators must be instructed and trained in the safe operation of this plant.
- Less experienced operators should have an increased level of supervision.

Further Information

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WorkSafe Victoria is a trading name of the Victorian WorkCover Authority.