Ride on roller

Note: *It is recommended that you read the Supporting Information page before you read this factsheet.*

Preparation and completing work *(Preparation)*

- Ride on rollers fall into the category of compaction equipment and, in the construction sector, usually consist of a ride-on machine fitted with an articulated chassis equipped with smooth drum rollers. Types used for earthworks activities can consist of a forward-mounted drum and pneumatic tyres to the rear which have the ability to work on inclines and rough terrain and can be fitted with a sheepsfoot drum.
- Three-drum' rollers can still be found within the road building and highway maintenance sectors. Incidents are common with ride-on rollers, with the commonest causes being instability and overturning, and striking others. The aim of this factsheet to make operator aware of issues that have occurred and what should be taken into account when travelling and operating a roller.
- Pre-use checks that conform to manufacturers' requirements need to be carried out. Failure to do so has caused a near-miss or injuries when a roller's performance has deteriorated or a component has failed.
- If a fault or defect is noticed, the operator must report it immediately and not use the roller until they are authorised to do so. Even if they consider the fault to be minor, the operator should still seek expert advice as it could be a significant but not visible fault, or a minor fault that could get worse during the working day.
- The reversing of vehicles is still a significant factor in accidents, injuries and fatalities in the workplace. Rollers are fitted with a reversing warning system, and one of the essential checks that should be taken by the operator before work is the correct function of the alarm and that it is sufficiently audible or loud enough to be heard by anyone who is behind the roller.
- A safety stop button is a common feature on rollers and depressing the button immediately cuts the engine, which further stops transmission drive. This should be checked for correct operation as part of the pre-use checks.
- When they are being transported to a site, the majority of rollers – being articulated – should have had the articulation bar connected. This locks the chassis in a straight line during transport and should be removed before the roller is driven off the transporting vehicle.
- One method of compaction is via the weight of the roller acting through the drum onto the ground. If a roller is parked and left on soft ground, the machine can sink. This can both damage the ground and leave the roller unable to move unless it is towed by another machine.

Working safely and with others *(Working safely)*

- The reversing of vehicles is still a significant factor in accidents, injuries and fatalities in the workplace, so reversing warning systems need to be fully functioning.
- Guidance recommends that the reversing of vehicles is, as the first course of action, eliminated. Where this is not reasonably practicable, and rollers need to reverse as part of their compacting duties, then other measures must be taken with the next step being to minimise any reversing to within a segregated, controlled area where pedestrians or other worker movements are kept to a minimum.
- At the end of a run and before reversing, the roller driver must ensure that no vehicles or personnel are going to be in the path of the reversing roller. When reversing, all-round vision must be maintained at all times.
- If a co-worker or supervisor has stopped and approached the roller to speak to the operator, the operator should ensure that the co-worker is well clear of the roller's operating area before moving off again.
- If the travel route for the roller takes place on a site where there is pedestrian movement, the planning of any travel routes should be planned to ensure that pedestrians are segregated from the roller to avoid any contact.

- Planning should also take into account changes in the road or work surface, particularly in wet weather, as both off-road travel routes and work areas can become slippery and firm ground turn into soft ground. For example, even if a roller is travelling along an incline within the limits set by the manufacturer, it could slide if the ground is wet.
- Good practice, as well as manufacturers' recommendations, normally specifies that the engine of most plant is switched off when the operator exits the cab or seating area. This can prevent an operating or transmission lever being accidently moved, and may cause unintentional movement of the roller if the engine was left running.
- If a roller was parked near to an occupied trench with the engine running, not only could exhaust fumes enter the trench but also the static weight of the roller could place additional side stress on the trench edge and cause it to collapse.
- The majority of ride on rollers have a hydraulically operated transmission. If transmission components are incorrectly adjusted, a running engine can cause the roller to creep forward even if its transmission lever or pedal is in the neutral position.
- The hydraulic transmission also means that if the operator selects reverse whilst the roller is still moving forward, the roller can very suddenly decelerate and stop, which can cause an injury to the operator.
- A rolling specification would normally be devised and for which the operator would need to follow. The rolling specification may determine the amount of amplitude required.
- A low amplitude setting is normally specified when a heavier roller is compacted thin layers. The operator needs to select the appropriate settings and follow the stipulated number of passes and speed.
- Before any material is to be compacted, the area should be checked to ensure there are no voids or soft, weak areas as these have caused smaller rollers to overturn.
- When using vibration during the compacting process, operators need to be aware that the use of vibration close to an unsupported edge has caused rollers to, in effect, vibrate towards the edge and slide off it, causing it to overturn.

Stability and overturning *(Stability)*

- Ride on rollers are fitted with a roll over protective structure (ROPS), which is either the cab itself or an overhead frame. If the roller does roll over onto its side, the ROPS frame can minimise, but not eliminate, injuries to an operator providing they are wearing a seatbelt.
- They must also and they keep their limbs (arms, legs) within the confines of the operating station, particularly if the roller does not have an enclosed cab.
- Manufacturers normally indicate the maximum gradient allowed when travelling up, down and across inclines. One cause of possible instability is where the roller is being driven along a slope. If it is too steep, the roller's centre of gravity moves sideways and exceeds or goes beyond the width of the drum and can cause an overturn.
- Narrow drum rollers are particularly susceptible to sideways overturns even on gentle inclines and they can also become unstable on rough surfaces and soft ground.
- Another cause of many overturns is that an operator has travelled too fast for the site conditions. Manufacturers' requirements for inclines must be followed at all times.
- Travelling around a site presents a variety of hazards both for the operator and others. For example, travelling near to a trench can cause its sides to collapse. This may only overturn the roller and could also damage services in the trench and even bury persons working within the trench.
- Manoeuvring a roller up a small ramp, for example onto a raised kerb to compact a pathway, has caused injuries. This is because the roller has rolled over because an unsuitable ramp was being used. In other instances, the roller has travelled up the ramp too fast, overshot the pathway and fallen down an embankment.
- A safe access area should be sought and, if required, ramps must be constructed of suitable materials that have sufficient strength to take the roller's weight. Timber ramps must be selected carefully as they can break due to the weight of the roller.
- The roller should be driven forward and slowly up the ramp but if there is a drop on the other side, a safer access area should be sought and used. Although the use of a Marshaller may be helpful, they will not be able to prevent the incidents just described. Proper planning is the only way to prevent these incidents.

Sample questions

The following questions are based on the text within this factsheet and indicate how the questions and answers are structured. Based on the factsheet, there is only one correct answer. The correct answer to each question is indicated at the end of this factsheet.

Q1. Why could travelling or working on soft ground be more hazardous for a narrow drum roller than for larger units?

A. They can be more unstable

B. They require more power to work

C. The operator's visibility of the drums is restricted

D. They need to undertake more rolling passes

Q2. What should the operator ensure after completing a compacting run but before reversing?

A. That the correct compaction rate has been achieved

B. That nobody is in the path of the reversing roller

C. That the parking brake is applied

D. That the rotating beacon is active

Study checklist

This checklist aims to act as a study aid to ensure that the reader has identified and understood the relevant parts of this factsheet.

Do you know?

1. What action should be taken if a fault is found with the roller.
2. Why the reversing warning alarm should be sufficiently audible or clear before work starts.
3. What happens when the emergency stop button is depressed or activated.
4. Why a roller should not be parked on soft ground.
5. Why full all round observation must be undertaken before reversing a roller.
6. The reasons for the prior planning of travel routes.
7. Why the operating area of the roller needs to be segregated.
8. How wet weather can affect a roller when travelling.
9. Why the engine should be switched off before leaving the operators seat.
10. The effects on others that could occur if the engine of a ride on roller was left running.
11. Why a roller should never be travelled or parked too close to the edge of an excavation.
12. What could occur if using the vibration mode close to an unsupported edge.
13. How small voids or soft ground can cause instability.
14. Why a ROPS frame does not always prevent injury in case of an overturn.
15. The procedures to take in the event of an overturn.
16. How rollers can become unstable and the causes of overturns.
17. What the dangers are when a roller is being driven up a raised kerb.
18. Why timber ramps can be considered unsuitable for rollers.

Answers to sample questions: Q1: A and Q2: B