

Dump truck

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

Preparation for work *(Preparation)*

- Rear tipping dump trucks are a common feature on most construction and related sites. They transport large volumes of materials safely and efficiently from a loading area to a tipping area. Rear tipping articulated dump trucks in general have carrying capacities from around 14 tonnes up to around 50 tonnes, although rigid chassis types have carrying capacities well in excess of that.
- Driving a fully loaded dump truck can be hazardous for which correct and thorough preparation is essential for all plant, including rear tipping dump trucks, to ensure they are able to work safely and efficiently. Failure to properly check the dump truck before work could lead to injuries because faults can affect both the performance and safety of the dump truck.
- Defects noted by the operator, even if they consider them to be insignificant, must be reported otherwise the fault could get rapidly worse during the working day. For example, if the operator notices an oil leak from underneath the dump truck, they must report it immediately as they may not be sufficiently qualified or experienced to decide whether it is safe to use.
- Regular cleaning of the cab glass and mirrors should be undertaken before work starts as clear vision is an essential part of safe operations. Some of the cab glass on dump trucks can be difficult to reach, such as the front screen, which means the operator needs to plan the task, for example by using proper rail-equipped access steps, so that a fall from height can be avoided or minimised.
- This also applies when checking the dump truck for work as some checks may mean that the operator has to climb onto parts of the machine, such as the wheels or mudguards, and again they could slip or fall.

Working safely and with others *(Working safely)*

- Planning of work should take into account the ideal size of dump truck required. Where the dump truck is too small for the size of the loading machine such as an excavator, the risk of overloading is high, which could cause an incident such as overturning, particularly when it is travelling and turning.
- Where a dump truck is considered to be too large for the work or is working in a restricted area – particularly on smaller sites – loading can take longer and the operator may need to undertake additional manoeuvring. This is inefficient, can damage the working surface and can cause the dump truck to strike other machines or structures.
- Due to their large size, dump trucks have a number of blind spots when the operator is in the driving seat. Accident statistics indicate that one of the highest risks of a person on foot being struck by a truck is when the machine is pulling away. Operators need to make proper checks to ensure that no one is in the area of their machine before they move.
- Dump trucks are required to transport materials over a wide variety of terrain and over long distances, including soft ground, inclines and rough terrain which can present particular hazards for the dump truck operator.
- The work site should be planned so that travel routes from the loading point to the tipping point minimise, as far as is reasonably practical, the need to travel on poor terrain or steep inclines.
- The planning of haul routes needs to take into account other factors, such as pedestrians, who should be segregated from the dump truck's travel route on the haul road in order to avoid a collision.
- Planning should also take into account changes in the ground surface, particularly in wet weather, as the haul routes can become slippery and firm ground turn into soft ground.
- Where the haul route passes close to the edge of an embankment or slope, a suitable barrier should be provided to prevent or minimise the truck from going over the edge.

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- Tipping loads into a trench or over an edge is a particular hazard for dump truck operators as machines have gone over slope edges or into pits because stop blocks or earth berms have not been used, or have been insufficient.
- Although stop blocks or an earth berm should be used when tipping over an edge, operators should not rely on them from being able to physically stop the machine as they can only minimise the risk and not always prevent a dump truck from going over the edge.
- The operator needs to be in a safe place during the loading operation. In most dump trucks, the cab itself is usually approved as a falling objects protective structure (FOPS) or part of its tipping body may be the means of protection. This enables the operator to remain in the cab during loading and to move the machine immediately once loading has finished.
- If the operator chooses not to stay in the cab, they must be well clear of the loading operation so not to be struck by the loading machine and any overspill, or by other nearby moving vehicles.
- When the dump truck operator leaves the seat of the dump truck, they must ensure that the parking brake is applied, the transmission is in neutral and the engine is switched off. This ensures that the truck cannot move unintentionally, as accidents have occurred when the operator has accidentally moved a transmission or gear lever into drive when the engine has been left running, causing the machine to move unintentionally.
- Tipping a load requires care on the part of dump truck operators. When loads are being discharged from the body it is important, and recommended by nearly all manufacturers, that the dump truck is parked on firm, flat and level ground and that the hand/parking brake is applied.

Reversing issues *(Travelling)*

- Reversing vehicles are still a significant factor in accidents, injuries and fatalities in the workplace. Guidance recommends that the best method to reduce accidents is to prohibit the reversing of vehicles as the first course of action.
- Only where this is not reasonably practicable, such as in dump truck operations where reversing up to a tipping point is required, then other measures must be taken. The next step is to keep any reversing to a minimum and within a segregated, controlled area where pedestrians are excluded from.
- One instance where the operator, even with reversing aids, would have a blind spot is when they are reversing the truck and turning on full lock, as the outer radius or opposite side of the turn would be out of vision. Operators need to ensure the area is clear before reversing and seek assistance if required.
- As dump trucks by their design have limited vision from the operator's seat, additional vision aids such as mirrors and CCTV systems are fitted to assist in providing all-round vision.
- However each vision aid can have limitations which operators need to be aware of. For example, CCTV systems are commonly used but can be ineffective in strong sunlight. Mirrors for reversing are now mainly the convex type, as they provide a wider field of vision compared with conventional mirrors.
- Radar systems that detect the movement of other plant, vehicles or persons are becoming common on dump trucks. However, they can be triggered by objects outside the danger or working area. This means that some operators end up ignoring the warning signals and a potential incident could take place.
- Most radar systems allow the radar sensitivity to be adjusted. In confined or congested areas, some operators have excessively reduced the sensitivity in order to avoid false readings from objects outside the working area. This means it may not pick up objects or structures directly behind the machine and a potential for an incident exists.
- Operators need to follow the radar systems manufacturer's recommendations for adjusting radar sensitivity and not rely on just one type of visual or electronic aid.

Stability issues *(Stability)*

- The majority of dump truck cabs are approved roll over protective structures (ROPS) so that, in the event of the machine rolling over, the ROPS cab can minimise, but not prevent, injuries to an operator, providing the seatbelt is being worn.

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- Dump trucks can be unstable during operation so planning and care is required by the operator both before and during work. In principle, the machine's weight is biased towards its front, counteracting the load in the body.
- As a body is raised to discharge a load, particularly where it is overloaded, weight transfers to the rear of the machine, making it less stable. This means that the operator must take care when discharging loads and needs to operate all controls smoothly and only whilst on firm, level ground.
- If the dump truck is leaning to one side when it is discharging a load, the truck can tip over sideways as the centre of gravity is raised when a loaded body is raised, and exceeds the wheel track (the distance between the wheels on each axle).
- Tipping downhill on a slope also can cause the dump truck to tip up rearwards as the load can exceed the counterbalanced effect of the truck.
- Manufacturers have to provide information on what the maximum gradient the dump truck can travel on –up and down as well as along the slope – and on how the dump truck should be travelled up and down the slope.
- The direction of travel can vary depending on the steepness of the slope but if the manufacturer's guidance is not known, then in principle on steep slopes, a loaded dump truck must reverse up a steep slope and drive down it, keeping the body facing the hill.
- The opposite generally applies when the dump truck is unladen – the machine is driven up a slope and reversed down it. It is important, however, for the operator of each type of dump truck to consult the operator's manual before starting work.
- When travelling on haul roads between the loading and tipping points, care must be taken to avoid potholes and raised bumps because even small ones, particularly when the dump truck is travelling at speed, can cause it to become unstable or veer off in the wrong direction.
- A loaded dump truck will generally be less stable than an unloaded one because of the higher centre of gravity. This means that steering and braking actions need to be smooth, particularly when the dump truck is on inclines and turning sharply around tight corners.
- When travelling on temporary haul roads, operators need to maintain a reasonable distance from the edge of the road, as the sides have been known to collapse when the truck passes near the edge, causing the truck to become unstable and overturn.

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. Where the manufacturer's guidance is not known, how should a loaded dump truck both climb and descend a steep slope?



The body faces downhill when travelling up and down the slope



The body faces uphill when travelling up and down the slope



The body faces uphill when travelling up and faces downhill when travelling down the slope



The direction of travel is not critical on slopes

Q2. If the dump truck operator is in a protective cab when the dump truck is being loaded by an excavator, why should they remain in the driving seat?



They need to control loading operations



It is a safe position and they can move immediately once loading is complete



They have a better view of the body when it is being loaded



They can provide signals to other operators of plant

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. Why defects must be reported.
2. What actions should be taken when the cab glass needs to be cleaned.
3. Why the cab glass and mirrors should always be kept clean.
4. What could happen if the loading machine is too large compared to the dump truck.
5. What could cause a risk of injury to people on foot.
6. Why the route from the loading point to the tipping point should avoid rough terrain.
7. The actions that need to be taken to avoid collisions between pedestrians and plant on travel routes.
8. The actions to be taken when working near to an edge or embankment.
9. What may happen if stop blocks or earth berms are not used when tipping over an edge.
10. What can make CCTV systems ineffective.
11. How radar systems can be prevented from working correctly.
12. What the function is of the ROPS cab.
13. Why the machine can become unstable when a loaded body is raised.
14. There is a need to operate the controls smoothly.
15. What can happen if raising a loaded body on a slope.
16. Which direction a loaded dump truck should be travelled up a steep slope.
17. What can happen if travelling at speed on bumpy haul roads.
18. Why temporary haul roads can cause instability to a dump truck.

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