

Managing risks of vehicle loading cranes

A vehicle loading crane (VLC) is a crane mounted on a vehicle for the purpose of loading and unloading that vehicle (see Figure 1).



Figure 1 Example of a vehicle loading crane

With the introduction of larger capacity VLCs and proportional control (the ability to operate multiple crane functions simultaneously), they are also used for more traditional crane operations where the load is lifted:

- from the vehicle to an elevated area at a workplace, for example lifting packs of timber from the vehicle directly to a building floor
- both to and from locations remote from the vehicle on which the crane is mounted
- into place and held while it is connected to a structure e.g. installing a sign.

Although VLCs can be used for the above operations, the level of safety provided by the lifting set-up should not be less than when a mobile crane is used.

Mounting a crane on a vehicle

VLCs should be mounted on vehicle types and models specified by the crane manufacturer. Installing a crane on an inappropriate vehicle could lead to structural failure of the crane or vehicle or make the vehicle and crane combination unstable.

The crane should be mounted in accordance with the crane manufacturer's instructions or the recommendations of a competent person.

Welding the crane to the vehicle chassis is unacceptable as it can damage the chassis and lead to fatigue failure of the connection.

Second-hand VLCs imported from overseas must have a compliance plate attached by an authorised person in compliance with Queensland Transport requirements.

Crane controls

VLC controls should be:

- self-centring, constant pressure controls (so the operation of the crane stops when the operator releases the control)
- permanently marked with clear, visible symbols.

See AS1418.11 *Cranes, hoists and winches – Vehicle-loading cranes*.

Suitable risk control measures should prevent operators being crushed between the crane boom and the operator's control panel. These may include:

- using remote controls
- relocating the controls on the vehicle
- installing slew limiters to prevent the boom contacting the operator
- installing physical barriers
- providing operator controls that can only be operated from a position where the boom or load cannot be lifted over the operator
- providing an emergency system to ensure the boom cannot drop under its own weight or the weight of a load.

An emergency stop device must be provided and should be located at every control station on the crane. Emergency stops should:

- bring the crane to a complete stop
- be readily visible and coloured red
- easily accessed
- lock in the 'stop' positions when activated.

Load indicators

VLCs manufactured after 2003 should be fitted with a load indicator appropriate for the capacity of the crane. It should:

- warn the crane operator when the load exceeds 90 percent of the rated capacity
- give a separate and different warning to the 90 percent load warning to the crane operator and people near the crane if the rated capacity is exceeded.

Both warnings should be continuous.

Inspections and maintenance

Regular crane inspections, maintenance, and repairs are to be carried out in accordance with the instructions provided by the manufacturer or a competent person. Inspections must be completed at least annually.

Documentation

Documentation that should be kept with the VLC includes:

- crane operator manuals
- crane operator checklists or log books for completion as recommended by the manufacturer
- crane inspection, maintenance and service records that include information on when the next service is due.

Operator competency and licensing

VLC operators must be trained and competent in operating the crane. Training should cover the controls, instruments, working load limits, load charts, safe working procedures for slinging and lifting and any operating limitations of each type of crane they operate.

A person must hold a high risk work (HRW) licence to operate a vehicle loading crane that has

a capacity of 10-metre tonnes or more. This can be a:

- vehicle loading crane HRW Licence; or
- one of the four slewing mobile crane HRW licences¹.

A crane has a capacity of 10 metre tonnes if at any position on the crane's load chart, the radius (in metres) multiplied by the load (in tonnes) is equal to or greater than 10.

A person with a VLC HRW licence is able to apply load estimation and slinging techniques when operating the VLC under regular circumstances.

A licensed dogger is required if:

- the VLC is being used to position loads in elevated or remote positions; or
- the operator is operating the crane under a slewing mobile crane licence

A VLC operator must hold the appropriate driver's licence for the VLC's class of road vehicle before driving it on a public road.

Further information on VLC HRW licensing is in *High risk work licensing training and assessment information*.

Operating a VLC

To operate a VLC safely, operators must be trained in the specific operation of the particular VLC. The following risk controls should be implemented.

Vehicle loading crane set-up

When selecting the set-up location for the vehicle loading crane, a check should include that:

- there are no underground services or recently backfilled excavations that may affect the stability of the crane
- the crane can be set up level—the crane should only be operated when level
- there is a safe distance between the boom over its full range of movement and overhead electric lines and other obstacles.

If the crane is fitted with outriggers, ensure:

- ground surfaces are sufficiently stable and

¹ Slewing Mobile Crane - with a capacity up to 20 tonnes; Slewing Mobile Crane - capacity up to 60 tonnes; Slewing

Mobile Crane - capacity up to 100 tonnes and Slewing Mobile Crane - capacity over 100 tonnes.

- compacted to support the crane
- legs are marked with ‘zebra striping’ to improve visibility
- the outriggers are fully extended, or extended according to the manufacturer’s instructions so that the crane interlock, where fitted, is disengaged
- the outriggers are located on pads or other suitable support material.

General operation

The manufacturer’s instructions should always be followed when operating a VLC.

A VLC should not be operated if it is malfunctioning. The issue should be immediately reported to the responsible person and the crane tagged out of use if appropriate.

VLCs must not be used for:

- lifting people (unless burst protection is fitted as per the Mobile crane Code of Practice 2006); or
- pick-and-carry operations.

Moving loads

The rated capacity of the VLC should be known before starting work. Operating a VLC outside its rated capacity can cause the vehicle to overturn.

The manufacturer’s instructions should always be followed when deciding the method to lift the load, for example, whether to unfold or fold the boom.

Calculate the working radius and rated capacity for the load for all positions. If the rated capacity displayed on the load chart does not exceed the mass of the load for a particular working zone, lifting should not be attempted in that zone.

The VLC operator must be able to see the load at all times during the lift. If the load is out of the operator’s view, the lifting process must be directed by a licensed dogger or rigger.

Crane hooks with spring-loaded safety latches should be used and maintained in accordance with the manufacturer’s instructions.

The VLC should only be used with the load suspended vertically from the hook—the crane should not be used to drag the load over any surface.

The boom should never be positioned directly above the operator control stations or above their head.

Further information

- Mobile crane Code of Practice 2006 (Part 16)
- AS 2550.1-2011: *Cranes, hoists and winches—Safe use Part 1: General requirements*, and
- AS 2550.11-2016: *Cranes, hoists and winches—Safe use Part 11: Vehicle-loading cranes*.