Mobile Crane

Dimension Measurement Procedure

Measurement Procedures

1. Introduction

These procedures are designed to assist and support certifiers[1] in determining the accurate dimensions of mobile cranes for vehicle registration and compliance with the New South Wales legal requirements.

Providing a false or misleading declaration is an offence and may result in the operator not having the benefit of the exemption as a result of the incorrect measurement.

The intent of this procedure is to:

- Standardize the method of measuring mobile cranes for registration.
- Assist certifiers to determine the correct dimensions of mobile cranes for registration purposes.

Note: This procedure reconigses that certifiers are familiar with the use measurement equipment for the purpose of determining correct dimensions.

2. Equipment

All measuring equipment must be maintained in good order, checked regularly and withdrawn from service if it is unserviceable or the accuracy is in doubt. Equipment must meet the Australian Standard.

Typical equipment for measuring vehicle dimensions includes:

- Tape measures; and,
- Height sticks.

Highly accurate laser technology and electronic measuring devices are available and must be used where possible. Certifiers that have access to such equipment should use it in accordance with the manufacturer's instructions.

3. Inspection sites

In general, any site that is level, clear of obstructions and can safely accommodate a stationary mobile crane can be used for measuring vehicle dimensions. For measurements spanning multiple vehicle units (e.g. overall length of an articulated combination) the site must allow the vehicle to be parked with all units and their wheels traveling in a straight line.

Certifiers must check the inspection site before commencing vehicle measurement. The area must be clear of any obstructions or debris likely to cause injury or damage or to distort the measurements taken.

1 The word ‘certifiers’ in this document relates to persons authorized under the Special Purpose Vehicle Certification Program by the NSW Roads and Maritime Services.

4. General measuring practice

Certifiers must ensure that:

1. The crane is stationary and that the transmission is in neutral.

2. The engine must be off.

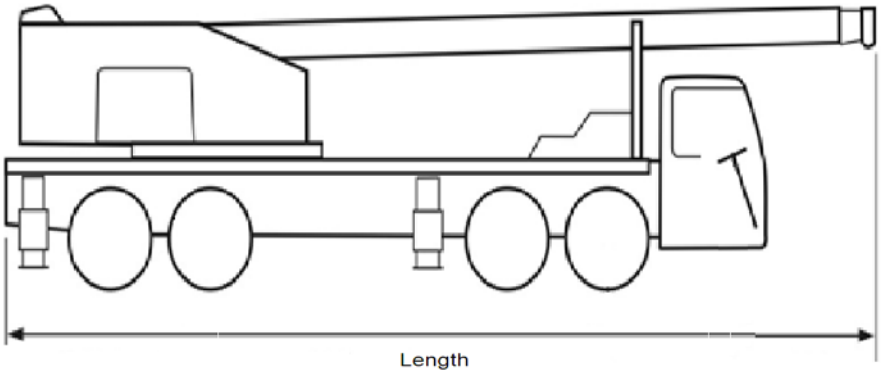
3. The parking brake must be applied whenever dimension measurements are being taken.

4. The road wheels and any towed units must be in positions corresponding to the movement in a straight line.

4.1 Procedure for measuring length

Length can be defined as the longitudinal distance between two transverse vertical planes which touch the front and the rear of the vehicle respectively.

The length of a crane is measured taking into account any equipment mounted on the crane (e.g. bump stop rubbers fitted to the rear of the crane or crane combination).
No concession applies to items that might be mounted on the crane such as winches or sheave block, etc.



Method of measurement – Length

- Using a tape measure, one certifier takes the loop or zero end of the tape and stands at an end of the crane holding the free end of the tape in line with the furthermost point of the crane. Avoiding tape droop or sag.

- Taking any curvature or projection at the front of the crane into account.

- If possible the hand holding the tape should be held against a solid part of the crane (such as the bumper or bull bar) to steady the position of the tape measure.

- The second (or reporting) certifier holds the tape measure at the same height as that at the other end of the crane. Applying a steady pull to the tape measure to remove the sag.

- The certifier at an end must recheck the alignment of the tape in relation to the crane at the front and signal that the measurement is ready to be taken.

- The certifier at the other end of the vehicle then lines up with the furthermost point of the crane that may project beyond the crane's length e.g. counter weights and reads the corresponding measurement from the tape.

- Record the measured dimension as the overall length of the crane including any part that may project beyond the length e.g. jib, counter weights, etc. of the crane in the measurement.

- Ensure the measurement was accurately taken and recheck.

- Record the measurement on the Mobile Crane Application form and the other certifier verifies the measurement as being accurate.

Points to Consider - Length

Compare the measurement taken against the maximum legal dimension limit (available from the National Heavy Vehicle Regulator (NHVR) website) for the configuration of crane.

Does the measured length of the crane or crane combination exceed the maximum length dimension allowed?

- lf 'yes' then consider action to reduce the measured amount in excess of the maximum allowed. Ensure that the crane is in its most compact form.

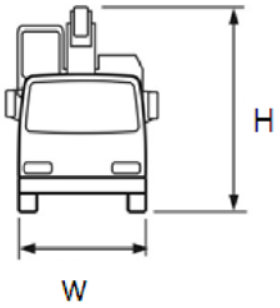
- lf 'no' then take no further action and complete the measurement process.

4.2 Procedure for measuring width

Width can be defined as the distance between the widest points on a crane or crane combination.

The width of a crane is measured **without taking into account** any anti-skid device mounted on wheels, central tyre inflation systems, lights and mirrors, reflectors, signalling devices or tyre pressure gauges.

As far as practicable, any method of assessing width must avoid tape sag as a potential source of error, e.g. by measuring along the ground or along the side rail of the crane.



Method of measurement - Width

- Using a plumb bob, level, tape measure, height stick and determine the widest point to be measured.
- If any projection exists which is flat and accessible, hold the tape measure against the edge of the projection and measure to the side of the crane.
- If the widest point is out of easy reach, hold the height stick against the projection and mark the widest point on the ground. The height stick should be held as close as practicable to parallel to the side of the crane in order to avoid distortion on a sloping site. Similarly, mark the ground at the side of the crane and measure between the two points on the ground.
- The widest point and the side of the crane can be marked on the ground using a plumb bob or level.
- Measure the overall width of the crane.
- Measure the width of the projection on the other side of the crane in the same way as the projection on the first side was measured.
- Ensure the measurement was accurately taken and recheck.
- Record the measurement on the Mobile Crane Application form and the other certifier verifies the measurement as being accurate.

Points to Consider – Width

Compare the measurements taken against the maximum legal dimension limit (available from the National Heavy Vehicle Regulator (NHVR) website) for the configuration of crane.

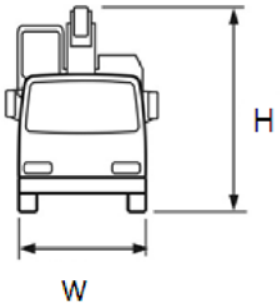
Does the measured width of the crane or configuration exceed the maximum width allowed?

- If 'yes' then consider action to reduce the measured amount in excess of the maximum allowed. Ensure that the crane is in its most compact form.

- If 'no' then take no further action and complete the measurement process.

4.3 Procedure for measuring height

Height can be defined as the distance between the ground level and the highest point of a crane or crane combination.



Method of measurement – Height

- By standing away at the side or end of the crane, the certifier can identify the highest point of the crane. If the surface is significantly uneven at this point then the certifier may need to move the crane.
- The height stick is held against the side or end of the crane at the highest point.
- When the second (or reporting) certifier confirms that the height stick is placed and extended correctly, the certifier holding the height stick reads the height indicated.
- Ensure the measurement was accurately taken.
- Record the measurement on the Mobile Crane Application form and the other certifier verifies the measurement as being accurate.

Points to Consider - Height

Compare the measurement taken against the maximum legal dimension limit (available from the National Heavy Vehicle Regulator (NHVR) website) for the crane configuration.

Does the maximum height of the crane or crane configuration exceed the maximum height allowed?

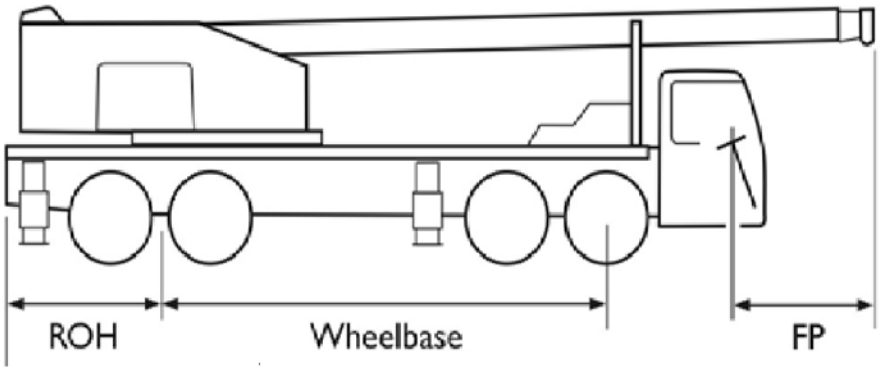
- If 'yes' then consider action to reduce the measured amount in excess of the maximum allowed. Ensure that the crane is in its most compact form.
- If 'no' then take no further action and end the measurement process.

4.4 Procedure for measuring rear overhang

Rear overhang is defined as the distance between the rear overhang line and the rear of the crane. The rear overhang line is defined as:

- if there is a single axle at the rear of the crane—the centre line of the axle, or
- if there is an axle group at the rear of the crane—the centre of the axle group, decided without regard to the presence of any steerable axle unless all axles in the group are steerable.

The rear overhang of a crane is measured taking into account any equipment mounted on the rear of the crane (e.g. bump stop rubbers fitted to the rear of the crane or crane combination).
No concession applies to items that might be mounted on the crane such as winches or sheave block, etc.



Method of measurement – Rear Overhang

- Using a tape measure, one certifier takes the loop or zero end of the tape and stands at an end of the crane holding the free end of the tape in line with the furthermost point of the crane.
- Take into account, as much as possible by judgment, any curvature or projection at the rear of the crane.
- If possible the hand holding the tape should be held against a solid part of the crane (such as the bumper) to steady the position of the tape measure.
- The second (or reporting) certifier holds the tape measure at the same height as that at the rear overhang line and applies a steady pull to the tape measure (this should remove the sag from the tape).
- The certifier at an end must recheck the alignment of the tape in relation to the crane at the rear overhang line and signal that the measurement is ready to be taken.
- The certifier at the rear overhang line reads the corresponding measurement from the tape.
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- Record the measured dimension as the rear overhang of the crane including any part that may project beyond the rear of the crane in the measurement.

- Ensure the measurement was accurately taken.

- Record the measurement on the Mobile Crane Application form and the other certifier verifies the measurement as being accurate.

Points to Consider - Rear Overhang

Compare the measurement taken against the maximum legal dimension limit (available from the National Heavy Vehicle Regulator (NHVR) website) for the configuration of crane.

Does the measured rear overhang of the crane or crane combination exceed the maximum rear overhang dimension allowed?

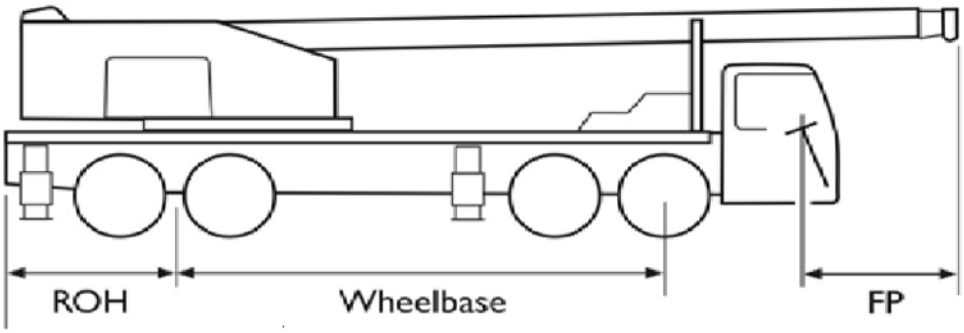
- If 'yes' then consider action to reduce the measured amount in excess of the maximum allowed. Ensure that the crane is in its most compact form.

- If 'no' then take no further action and complete the measurement process.

4.5 Procedure for measuring the projection in front of the centre of the steering wheel

Projection in front of the centre of the steering wheel can be defined as the horizontal distance between the centre of the steering wheel and the foremost point of the crane.

The projection in front of the centre of the steering wheel of a crane must be measured taking into account any equipment mounted on the front of the crane (e.g. sheave blocks, lattice booms or any other projections fitted to the front of the crane).
No concession applies to items that may be mounted on the front of the crane.



Method of measurement – Projection in front of the centre of the steering wheel

- Using a tape measure, one certifier takes the loop or zero end of the tape and stands at the front of the crane holding the free end of the tape in line with the foremost point of the crane.
- Take into account, as much as possible by judgment, any curvature or projection at the front of the crane.

- If possible the hand holding the tape should be held against a solid item, such as a height stick, ensuring that it is square and parallel with foremost projection of the crane, to steady the position of the tape measure.

- The second (or reporting) certifier holds the tape measure at the same height at the centre of the steering wheel and applies a steady pull to the tape measure (to remove the sag from the tape).

- The certifier at the foremost point of the crane must recheck the alignment of the tape in relation to the crane at the steering wheel centre and signal that the measurement is ready to be taken.

- The certifier at the steering wheel centre reads the corresponding measurement from the tape.

- Projection in front of the centre of the steering wheel of the crane must including any part that may project beyond the front of constructed length of the crane in the measurement.

- Ensure the measurement was accurately taken.

- Record the measurement on the Mobile Crane Application form and the other certifier verifies the measurement as being accurate.

Points to Consider - Projection in front of the centre of the steering wheel

Compare the measurement taken against the maximum legal dimension limit for the configuration of crane.

Does the measured projection in front of the centre of the steering wheel of the crane or crane combination exceed the maximum dimension of 3.50 metres?

- If 'yes' then consider action to reduce the measured amount in excess of the maximum allowed. Ensure that the crane is in its most compact form.

- If 'no' then take no further action and complete the measurement process.

4.6 Procedure for measuring overall axle ground contact width

Overall axle width can be defined as the distance between the outermost point of ground contact of the outside tyres on each end of the axle, and in relation to an axle group, means the greatest ground contact width of all the axles in the group.

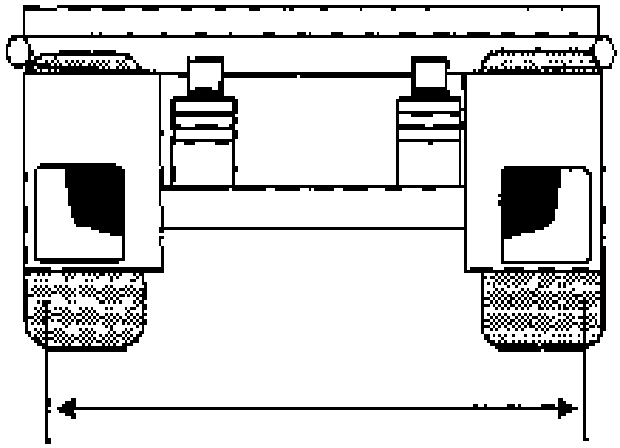


Illustration of overall axle ground contact width

Method of measurement – Overall axle ground contact width

- Using a tape measure, one certifier takes the loop or zero end of the tape to the side of the axle of the crane holding the free end of the tape at the outermost point of ground contact of the outside tyres of the crane.

- The second (or reporting) certifier holds the tape measure at the same point on the opposite side of the axle and applies a steady pull to the tape measure (this should remove the sag from the tape).

- Measure the overall axle width.

- Ensure the measurement was accurately taken.

- Record the measurement on the Mobile Crane Application form and the other certifier verifies the measurement as being accurate.

4.6 Procedure for measuring the distance between axles

The distance between axles can be defined as the horizontal distance between the centre-lines of the each axle of the crane.

Method of measurement – Distance between axles

- Using a tape measure, one certifier takes the loop or zero end of the tape to the centre-line of the first axle to be measured.
- The second (or reporting) certifier holds the tape measure at the same point on the second axle to be measured and apply a steady pull to the tape measure (this should remove the sag from the tape).
- Measure and record the distance between the two axles.
- Ensure the measurement was accurately taken.
- Record each measurement on your application and the fact that the other certifier has confirmed the measurement as being accurate.

Reference Documents:

National Heavy Vehicle Regulator (NHVR) ‘National heavy vehicle general dimension requirements’ fact sheet.

National Heavy Vehicle Regulator (NHVR) ‘Special Purpose Vehicles (SPV)’ fact sheet.

For further enquiries RMS Technical Enquiries, PO Box 1120, Parramatta NSW 2124
T 1300 137 302 **| F** 02 8849 2754 **| E** tech-enq@rms.nsw.gov.au **www.rms.nsw.gov.au**