

Measuring Motor Vehicles and Trailers

Heavy Vehicle Registration Assessment Scheme (HVRAS)

Measurement and inspection are a requirement for a motor vehicle or trailer to be registered. The purpose of the HVRAS accredited person completing an inspection on a motor vehicle or trailer prior to registration is to verify the vehicle's details:

- match the vehicle details stated on the application; and
- assess the compliance of the vehicle dimensions.

Each vehicle that is inspected for registration must have a completed Vehicle Details form (F3529) with every inspection sheet.

This form contains information required by the Department of Transport and Main Roads (TMR) to register the vehicle that may not be on an inspection sheet. For example, the colour of the vehicle.

As a HVRAS accredited person you are not authorised to give advice on how to make a vehicle compliant. If any identifiers are not located on the vehicle/trailer the inspection must not proceed until all are located.

Trailers with low volume VIN (LVV)

Trailers with a LVV **must attend** a transport and motoring services centre with the identifier in order for TMR to conduct an identity check **prior to first registration**. The purpose of this inspection is to confirm the identifier has been attached to the correct trailer and is stamped on the trailer and recorded on the identification plate. The identity check is only required the first time the trailer is registered with the identifier.

Not all TMR locations have the capacity to conduct TMR identity checks. To confirm if a location can inspect the vehicle/trailer, refer to <https://www.qld.gov.au/transport/contacts/centres> for the list of services provided by location.

Some important points to remember when measuring vehicles

When measuring a vehicle, make sure you measure to the widest point, excluding mirrors and/or clearance lights. However, if these lights have fixed steel or other material covering them, that should also be included in the measurement.

When measuring a caravan, you must measure to the very rear and include spare tyres, bike racks or jerry can holders and ladders.

When measuring trucks fitted with a tow coupling, you must include the tow coupling when measuring the length. You must also include any projections to the sides (e.g. brackets for tying down the load or steps).

The standard equipment required to be used includes:

- telescoping height pole or laser measuring device
- plumb-bob
- steel measuring tape
- chalk.

Measuring the height

A height pole is extended, held vertically and placed adjacent to the highest point. The height measurement is taken from the gauged readout on the height pole.

Measuring the width

Single measure method

When there is a projection from only one side of the vehicle, or where the widest point of projection on each side is at the same distance along the length of the vehicle, the following method can be used.

1. Identify the widest point to be measured.
2. Hold the plumb-bob against the widest point on one side. As far as practicable it should be parallel to the side of the vehicle. Mark that point on the ground.
3. Similarly, mark the widest point on the other side of the vehicle. As far as practicable, the line between the two points should be perpendicular to the centreline of the vehicle.
4. Measure the distance between the two points using a tape measure held taut along the ground.

Measurements are to be taken at the widest point excluding the following devices:

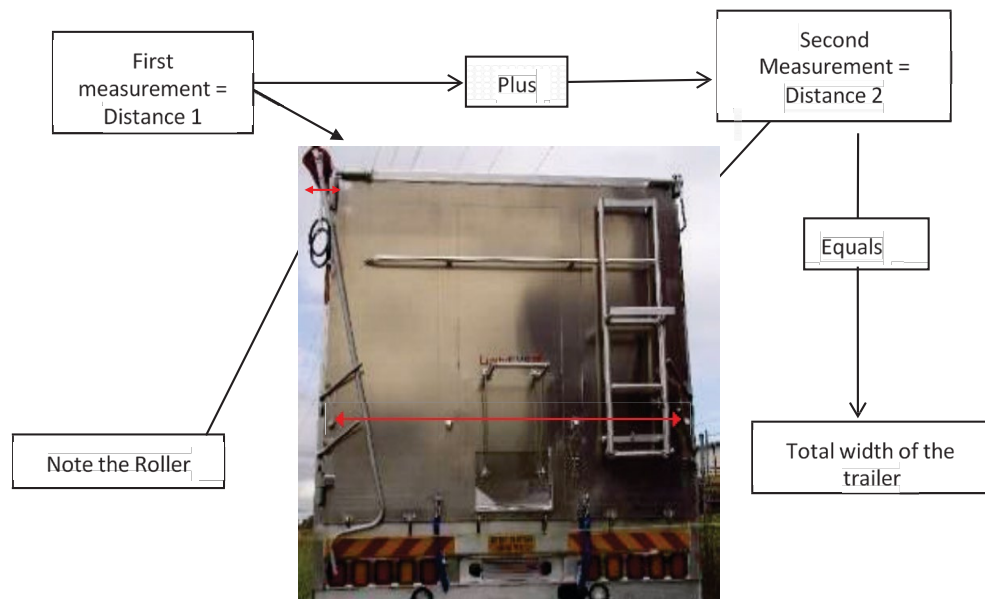
- anti-skid devices mounted on wheels
- fitted central tyre inflation system
- fitted side marker light and fitted reflectors
- fitted mirrors/indirect vision system (camera)
- fitted signalling devices
- fitted tyre pressure gauges
- permanently fixed webbing assembly-type devices, such as curtain side devices, if the maximum width across the vehicle and including the devices, does not exceed 2.55 metres
- removable load restraint equipment, if the maximum distance across the body of the heavy vehicle, including any part of the equipment, is not more than 2.55 meters.

Vehicle-projection method

If the widest points on either side of a vehicle do not line up, the vehicle-projection method is to be used.

1. Starting on one side, identify the widest point.
2. If the projection is flat and accessible, hold the tape against the edge of the projection and measure to the side of the vehicle. Mark this point on the ground. If the widest point is out of easy reach, hold a plumb-bob against the projection and mark this wide point on the ground.
3. Holding the plumb-bob against the side of the vehicle, mark this point on the ground. Using a tape measure held taut along the ground, measure between the two points marked on the ground to find the width of the projection. Record this measurement.
4. Repeat steps one to three for the other side of the vehicle if there are projections on both sides.
5. Measure the width of the main vehicle by holding the plumb-bob against one side of the vehicle and mark this point on the ground. Repeat this step on the other side of the vehicle. Using a tape measure held taut along the ground, measure between these two points to find the main width of the vehicle. Record this measurement.
6. Add the recorded measurements from steps 2 to 5 together to get the total assessed vehicle width.

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Measuring the width

Measuring the length

1. Identify the extreme front point of the vehicle or trailer.
2. Using a plumb-bob, mark this point on the ground and extend a straight line from that point past the side of the vehicle. As far as practicable, this line should be perpendicular to the centreline of the vehicle.
3. Similarly, mark the extreme rear point and extend a line from there to the side of the vehicle.
4. Measure the distance between the front and rear lines using a tape measure held taut along the ground.
5. Alternatively, the vehicle can be moved (if possible) which will negate the need to extend lines past the side of the vehicle.

Measurements are to be taken at the longest point excluding the following devices:

- fitted mirrors
- rubber bump stops fitted to the rear bumper bars of trucks and trailers.

Where possible, whenever assessing length, the measuring tape should run flat along the ground to avoid sagging or twisting which creates errors.

Dimensional limits

The correct assessment of vehicles and trailers is to ensure the safety of the towing vehicle, other road users and the road network assets.

Truck and trailer combinations must operate safely to reduce the risk that may arise from the demand road networks and traffic environment place on the manoeuvrability and stability of vehicles.

Improving vehicle stability assists in reducing incidences such as rollovers and loss of control crashes in heavy vehicles. It also reduces the tendency of heavy vehicles with trailers to jack-knife while undertaking emergency manoeuvres, in particular, when braking into corners.

Dimensional limits are set for vehicles and trailers to ensure minimum acceptable standards of road safety for all road users as well as protecting the road system.

Internal dimensions (i.e. overhangs, location of turntables, axle spacing) are set to help vehicles safely navigate intersections and other road curves without encroaching on other traffic or roadside infrastructure.

External dimensions (i.e. length, width and height) are determined to help vehicles clear under/over bridges, power lines, fibre optic cables and roadside fixtures such as signs and guard rails. When width is considered the following is to apply.

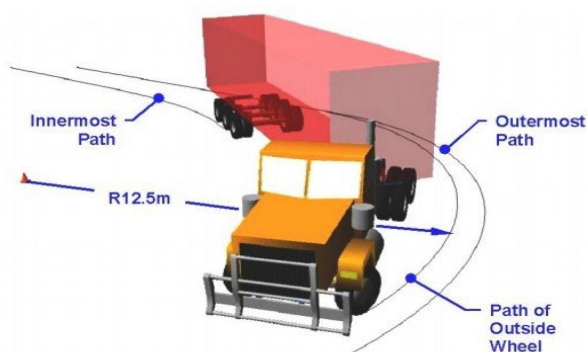
Measurement is to be taken at the widest point excluding anti-skid devices mounted on wheels, central tyre inflation systems, lights, and mirrors, reflectors, signalling devices or tyre pressure gauges.

It is also important that vehicles meet internal and external dimensional limits so that they don't exceed the swept path limits of roads where the swept path is the road area covered by the outermost and innermost points of the vehicle units during the turn.

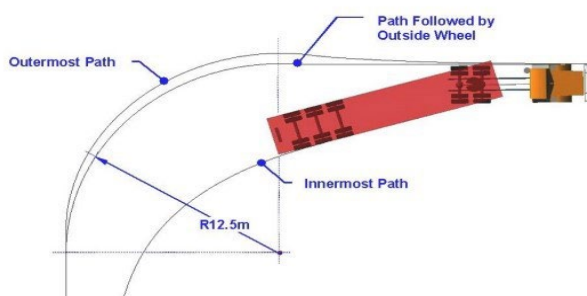
Swept path

When a vehicle performs a turning manoeuvre, the rear of the vehicle or combination may cover a different path towards the inside of the turn than the path of the foremost vehicle unit.

When operating at maximum laden mass and unladen, the maximum width of the swept path of a vehicle in the prescribed 12.5m radius 90° turn performed at a speed of no more than 5 km/h must be no greater than the specified value. (Refer to Section C7 [Low-Speed Swept Path] of the NHVR [PBS Scheme - The Standards and Vehicle Assessment Rules](#) for further details)



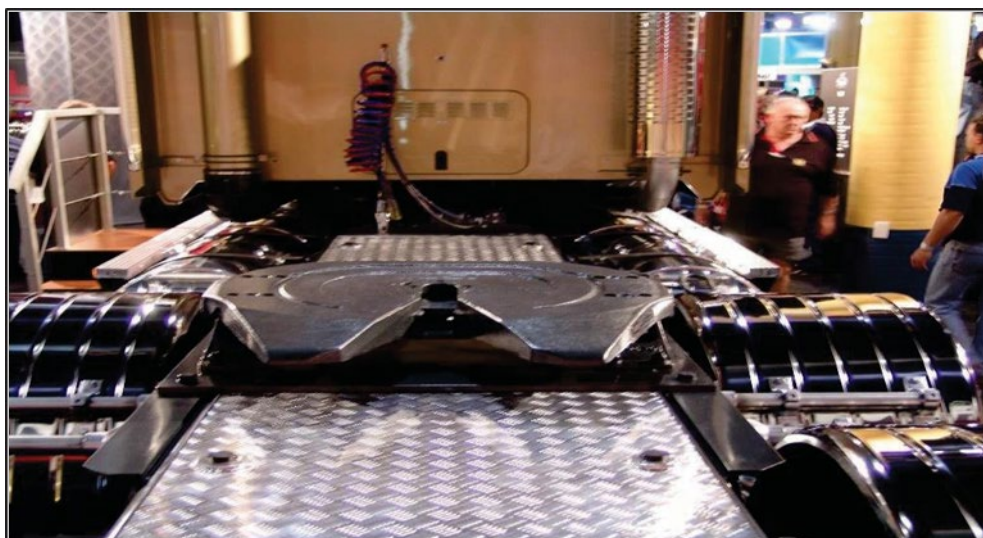
Perspective view illustration of vehicle partway through the Performance Based Standards low-speed turn showing path trajectories.



Plan view illustration of path trajectories that define the vehicle's swept path in the Performance Based Standards low-speed turn.

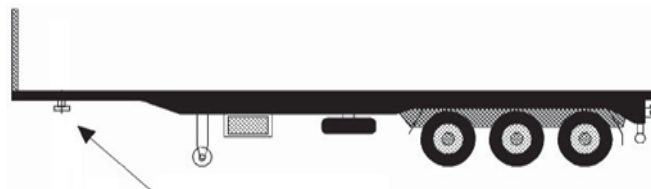
Fifth wheel

Prime movers are fitted with a fifth wheel coupling which provides a link between a semi-trailer and the towing vehicle, lead trailer or dolly through a connection between the turntable and a king pin.



T measurement and king pin

The 'T' measurement is radial distance from the kingpin. All trailer components forward of the kingpin must be within 1.9m of kingpin. A kingpin is coupling pin welded or bolted in the centre of the front underside of a semi-trailer chassis, which couples to the fifth wheel of the prime mover or converter dolly.

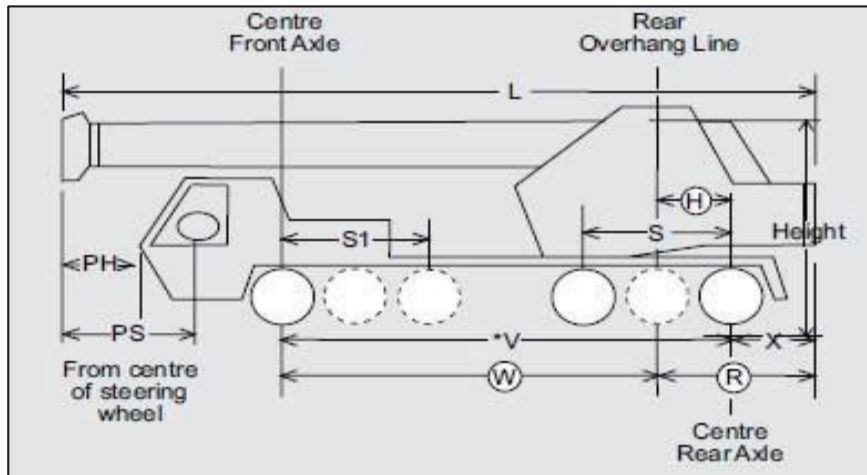


kingpin for fifth wheel

If the 'T' measurement cannot be taken this way, then Pythagoras Theory can be used. This measurement indicates the swept path of the trailer when the prime mover negotiates a corner.

PH measurement

The PH measurement is the measurement from the headlights to the end of the projection point, in front of the headlights. The PH measurement is only applicable to loading on a vehicle not integral components such as booms.



Load sharing and non-load sharing axle systems

There are two types of axle systems that are fitted to heavy vehicles and trailers. These are categorised as load sharing or non-load sharing suspensions.

It is very important that you correctly distinguish between the load sharing or non-load sharing axle systems. If the axle group is not fitted with an approved load sharing suspension (with effective damping characteristics) it is known as non-load sharing.

Examples of effective damping characteristics are springs, coils or air bags suspension.

Load sharing suspension

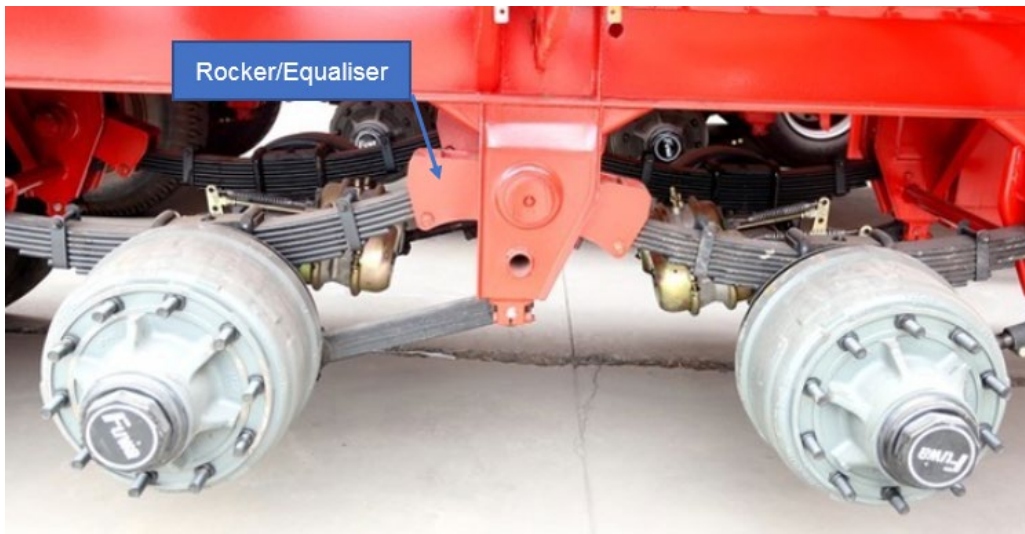
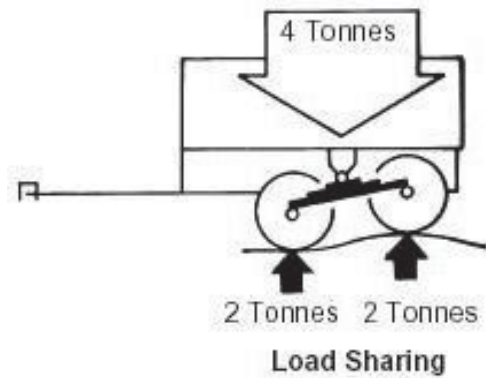
Load sharing suspensions are designed so that each axle in a group carries the same load irrespective of the relative movement of the wheels.

Load-sharing suspension means an axle group suspension system:

- (a) built to divide the load between the tyres on the group so no tyre carries a mass more than 10 per cent above the mass it would carry if the load were divided equally; and
- (b) with effective damping characteristics on all axles of the group.

Not all load-sharing suspension is road friendly.

Example of a load sharing suspension system on a trailer



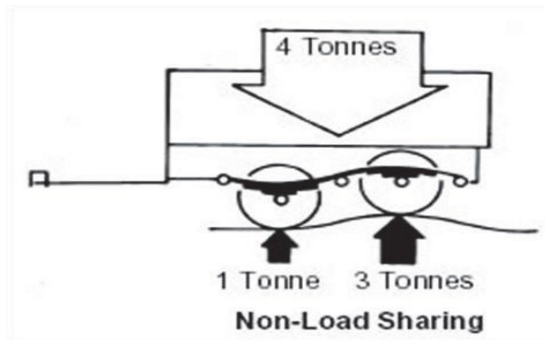
In this instance, a device called a rocker is fitted between the axles and the springs are attached to the rocker. If one axle moves over a rise in the pavement it causes the springs to push up on the rocker. The rocker acts like a see-saw forcing the other axle to remain in contact with the pavement.

Non-load sharing suspension

Each axle pack operates independently of the other axle.

The example below shows how a 4 tonne load on a trailer with non-load sharing suspension distributes the load when going over an uneven surface on the road. The 4 tonne load is only an indicator of a load on a trailer. When no device such as a rocker is installed the axles are unable to share the load when passing over an uneven surface.

Example of a non-load sharing suspension system on a small trailer



Contact us

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