

Tow Mass Ratios for Agricultural Combinations

Purpose

The purpose of this information sheet is to assist farmers to calculate towed mass ratios and understand the tow mass ratio conditions of the *National Class 1 Agricultural Vehicle and Combination Mass and Dimension Exemption Notice 2019* (the Notice).

What is a tow mass ratio?

The tow mass ratio means the ratio of the **mass of the towing vehicle** to the **combined mass of the towed implements and/or trailers, when all vehicles are connected** as part of a combination.

The mass of the vehicle, implements and trailers include any load being carried.

The mass of individual units, as if the combination was separated, should not be used to calculate tow mass ratio. This is because when coupled, mass can distribute across to other units in the combination. For example, the mass can transfer through the tow coupling from a towed unit to the towing unit.

How do you calculate the tow mass ratio?

To calculate tow mass ratio, add up the mass of all implements/trailers to be towed and divide by the mass of the towing vehicle.

$$\text{(Sum of the mass of all implements and/or trailers) / mass of towing vehicle}$$

Why do the tow mass ratios exist?

Tow mass ratios are required for road safety reasons.

The ratio is important because it impacts braking performance and stopping distance, which are essential for maintaining road safety standards.

Normally, the *Heavy Vehicle National Law* (and previous state and territory laws requires a maximum tow mass ratio of 1:1 for combinations with unbraked implements and trailers.

The Notice now allows agricultural combinations with unbraked implements and trailers to have a tow mass ratio above 1:1, without the need for a permit, subject to conditions.

What are the tow mass ratios under the Notice?

Tow mass ratios for agricultural combinations with ADR complying braking systems

For agricultural combinations with implements and/or trailers complying with ADR 38/00 – Trailer Brake Systems, the combined total mass of towed implements and trailers may be **up to 3 times** the mass of the towing vehicle.

For example, when connected as part of a combination, a tractor with a mass of 11t can tow trailers/implements with a combined mass of 33t. This is a tow mass ratio of 1:3.

Note: ADR means Australian Design Rule

Tow mass ratios for non-ADR complying braking systems

For agricultural combinations with implements and/or trailers not complying with ADR 38/00 – Trailer Brake Systems, the combined total mass of towed implements and trailers is summarised in Table 1 (below).

*Under Schedule 8, Part 1, Section 24 of the MDL Regulation, the speed limit for agricultural implements and trailers with non-complying brakes is 50km/h.

Table 1: Maximum speeds and tow mass ratios for agricultural combinations with non-complying brakes on implements/trailers














Maximum Travel Speed	Allowable combined mass on implements/trailers with non-complying brakes
25km/h	Greater than 1.2 and up to 1.5 times more than the mass of the towing vehicle For example, when connected as part of a combination, a tractor with a mass of 10t can tow trailers/implements with a combined mass of up to 15t. This is a tow mass ratio of 1:1.5
50km/h*	Up to and including 1.2 times the mass of the towing vehicle For example, when connected as part of a combination, a tractor with a mass of 10t can tow trailers/implements with a combined mass of up to 12t. This is a tow mass ratio of 1:1.2







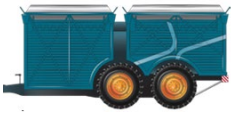
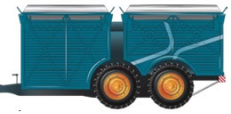











How were the tow mass ratio and speed conditions for agricultural combinations developed?

Engineering research and on-the-ground testing of a variety of implements and trailers with non-complying brakes found that agricultural combinations with a tow mass ratio up to approximately 1:1.2 could generally meet braking and stopping road safety standards.

Combinations with higher tow mass ratios were generally not able to meet the same safety standards. However, testing showed that if the maximum travel speed is reduced to 25km/h, the tow mass ratio could increase to 1:1.5 and meet the braking and stopping road safety standards.

Tow Mass Ratio Examples

Tow Mass Ratio	Agricultural Combination			Does the combination comply with the ratio in column 1?
	Note: In these examples, the combination has been separated into different columns to illustrate the mass on different units in the combination.			
1:1.0	 5 tonnes	 5 tonnes		✓ The trailer/implement has the same mass as the tractor.
	 18 tonnes	 13 tonnes	 5 tonnes	✓ The combined mass of the trailers/implements has the same mass as the tractor.
	 10 tonnes	 10 tonnes	 10 tonnes	✗ The combined mass of the trailers/implements is 2 times the mass of the tractor.
1:1.2	 8 tonnes	 10 tonnes		✗ The trailer/implement is 1.25 times the mass of the tractor.
	 10 tonnes	 6 tonnes	 5 tonnes	✓ The combined mass of the trailers/implements is equal to 1.1 times the mass of the tractor.

Tow Mass Ratio	Agricultural Combination			Does the combination comply with the ratio in column 1?
	Note: In these examples, the combination has been separated into different columns to illustrate the mass on different units in the combination.			
	 14 tonnes	 12 tonnes	 8 tonnes	<p style="text-align: center;">✗</p> <p>The combined mass of the trailers/implements is 1.43 times the mass of the tractor.</p>
1:1.5	 10 tonnes	 15 tonnes		<p style="text-align: center;">✓</p> <p>The trailer/implement has a mass equal to 1.5 times the mass of the tractor.</p>
	 10 tonnes	 7.5 tonnes	 7.5 tonnes	<p style="text-align: center;">✓</p> <p>The combined mass of the trailers/implements has a mass equal to 1.5 times the mass of the tractor.</p>
	 10 tonnes	 10 tonnes	 10 tonnes	<p style="text-align: center;">✗</p> <p>The combined mass of the trailers/implements is 2 times the mass of the tractor.</p>
1:3.0	 10 tonnes	 30 tonnes		<p style="text-align: center;">✓</p> <p>The mass of the trailer/implement has a mass equal to 3 times the mass of the tractor.</p>
	 10 tonnes	 15 tonnes	 15 tonnes	<p style="text-align: center;">✓</p> <p>The combined mass of the trailers/implements is equal to 3 times the mass of the tractor.</p>
	 10 tonnes	 20 tonnes	 20 tonnes	<p style="text-align: center;">✗</p> <p>The combined mass of the trailers/implements is 4 times the mass of the tractor.</p>

For more information:

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