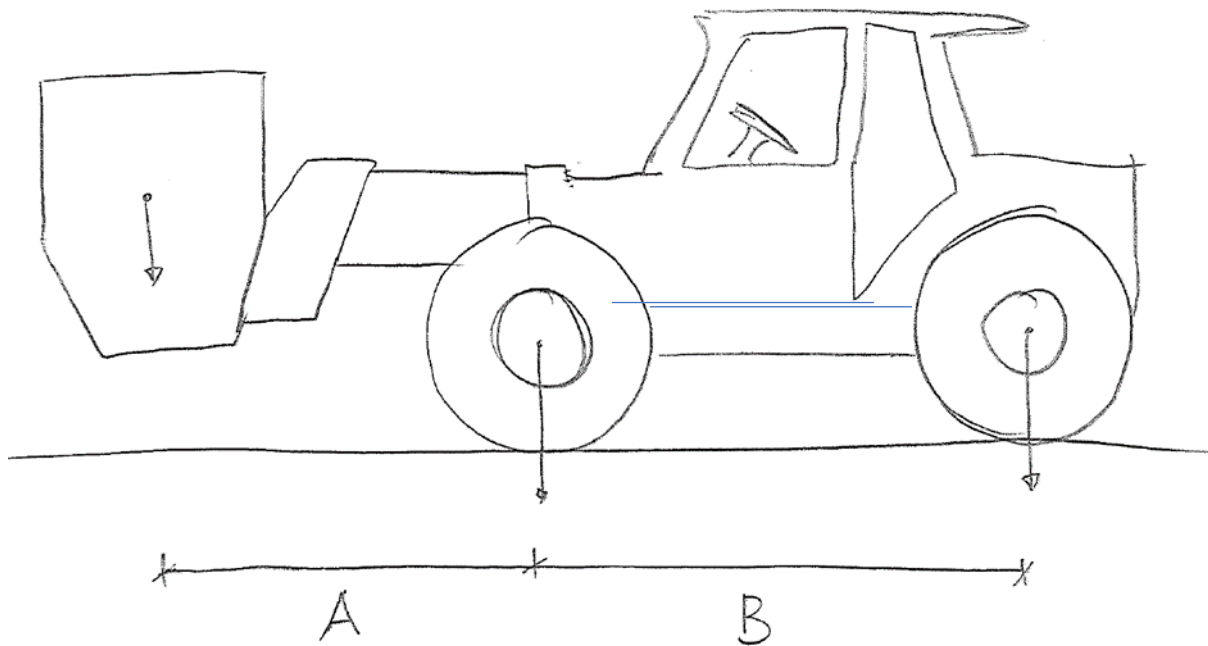


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If we assume that an unloaded vehicle has a centre of gravity at an equal distance between the two wheels, then each axle is equally loaded.

When the vehicle is loaded, the load on the telescopic jib moves the centre of gravity towards the front of the vehicle, putting more load on the front axle.

To calculate this additional load to the front axle from the loaded jib, moments are taken about the back axle.

Weight on jib x (A+B) = additional load to front axle x B

Rearranging this equation enables us to calculate the additional load as = $\frac{\text{weight on jib} \times (A+B)}{B}$

For example a 7.2t telehandler enters a slatted shed to spread sawdust. The dispenser weighs 560kg unladen, with a load of 350kg sawdust. The wheelbase of the telehandler (B) is 2.75m. The load is carried 2m from the front axle (A).

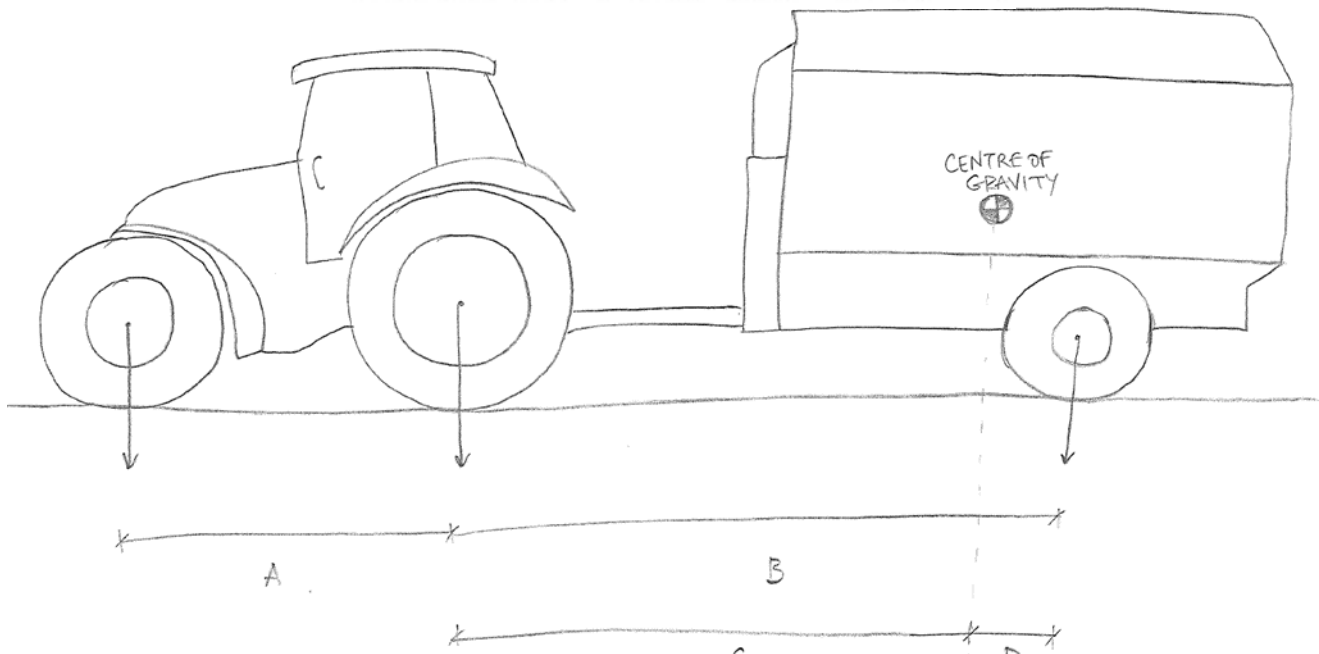
The unloaded telehandler has an axle load of $7.2/2 = 3.6\text{t}$

The additional load to the front axle from the dispenser and sawdust = $\frac{(560+350) \times (2+2.75)}{2.75} = 1572\text{kg}$

The total axle load of the front axle will be $3600+1572 = 5172\text{kg} = 5.17\text{t}$.

This load should be multiplied by a 1.5 safety factor producing to an axle load of 7.76t. The customer should ensure that the flooring products purchased from Moore Concrete have this axle rating.

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A tractor entering a slatted shed with a single axle feed wagon is another scenario which can lead to overloaded slats.

For this example we will consider a 4.5t tractor pulling a single axle feed wagon weighing 8t. The weight of the feed wagon is carried by the single axle and on the back axle of the tractor. Measurements C and D show the position of the feed wagon's centre of gravity relative to these axles.

The weight of the feed wagon carried by the tractor's back axle can be found by:

$$= \frac{\text{Total weight of feed wagon} \times \text{distance D}}{\text{Distance C} + \text{Distance D}}$$

If:

distance C = 4m

distance D = 1m

total weight of feed wagon = 8t

The additional weight to back tractor axle = $\frac{8 \times 1}{5} = 1.6\text{t}$. Therefore the total back axle weight is 6.1t.

The weight of the feed wagon carried by its own single axle can be found by:

$$= \frac{\text{Total weight of feed wagon} \times \text{distance C}}{\text{Distance C} + \text{Distance D}} = \frac{8 \times 4}{5} = 6.4\text{t}$$