CICA – Vic / Tas Branch
Crane Safety Bulletin
301
May 2022

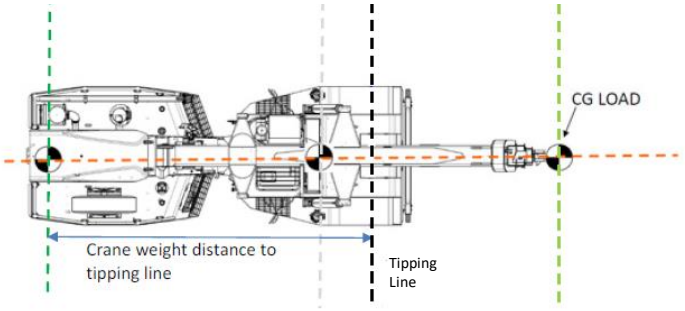
Greetings all. In today's bulletin we are going to talk about the different lifting characteristics between articulated pick and carry cranes and telehandlers.

In Victoria (and similar in the other States), both articulated pick and carry cranes and telehandlers (if the telehandler has a capacity greater than three tonne and does not have a work platform fitted) can be operated under a mobile crane High Risk Work Licence (with the minimum being a non– slewing CN licence).

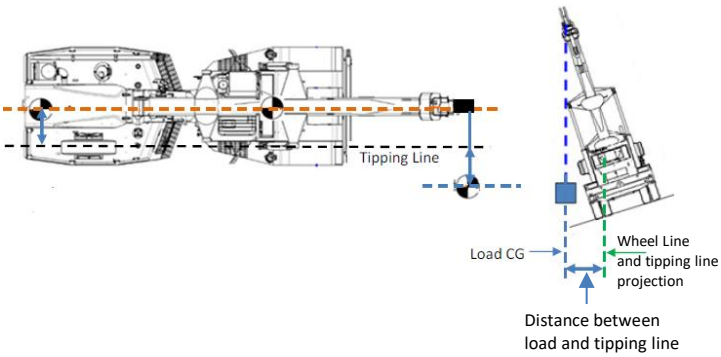
There are some similarities between these two types of machines. Unlike all terrain cranes, they lift on tyres and don't need outriggers for stability (some telehandlers have outriggers), and they can both lift and travel with a load. Although these two types of machines are both designed under the same set of Australian Standards (AS1418) for performing lifting tasks, the principles/physics behind their lifting operations can be different. In this bulletin, we will have a close look at one aspect of their lifting operation, which is when they are used to lift a load on a side slope.

Articulated pick and carry cranes

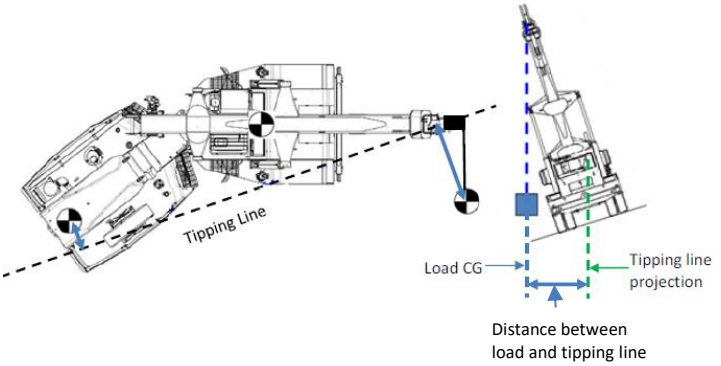
When operating articulated pick and carry cranes on a levelled supporting surface, the tipping line is at the front wheel line of the crane. The CoG of the machine and the CoG of the load are on the two sides of the tipping line.



When operating on a side slope, if the load offset goes beyond the crane wheel, the crane tipping line changed to the side wheel line as shown above. In this case, distance between the machine CoG and the tipping line greatly reduced.



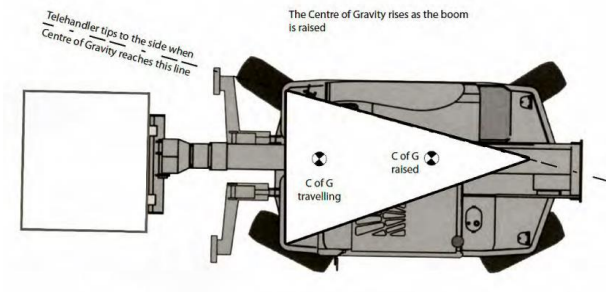
When operating on a side slope in articulated configuration, the crane tipping line changed to the side wheel line. In this case, distance between the machine CoG and the tipping line greatly reduced and distance between the load CoG and the tipping line increased.



Telehandlers

Telehandlers normally have freely oscillating rear axles, the tipping lines form a triangle, rather than the rectangle of machines supported on outriggers such as all-terrain mobile cranes (telehandler tipping lines can form a stability rectangle in the case that if a rear axle lock is activated). This has the effect of reducing lateral stability, particularly with the boom raised up high when lifting a load [1].

When the telehandler is used to lift and travel with a suspended load on a side slope, the combined machine and load CoG is shifted to the side and can be displaced outside of the stability zone.



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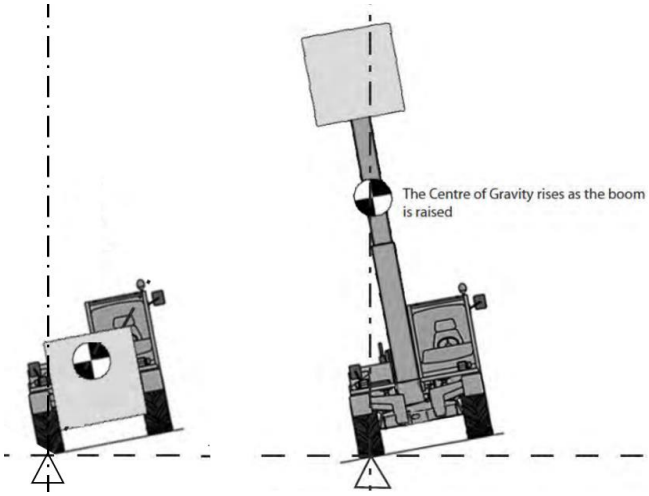

Summary

When operating on side slopes, there are different factors influencing or affecting the stability of the articulated pick and carry cranes and telehandlers. Even though they can both be operated under the same licence, in reality, competency requirements for the operators for these two types of equipment are different.

[1] Safe Use of Telehandlers in Construction, Strategic Forum for Construction Good Practice Guide, March 2015, Construction Plant-hire Association.

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