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Vehicle Loading Cranes

carefully designed to avoid twisting failure between the transmission mounts and the crane mounts. Half of VLCs are located at the rear, which is the less stable location and a cross-braced subframe is needed that is integrated with the rear suspension reinforcements. Both vehicle standards regulations and the work safety regulations apply to cranes on trucks and trailers. Anyone who owns and operates a VLC must understand the rules and obey them to keep the considerable risks that exist, under control.

There are two relevant Australian Standards, which are: AS1418:2014, Part 11, Vehicle loading cranes and AS 2550:2016 Part 11: Safe use – Vehicle Loading Cranes. Australian Standards are not the law unless they are specified in a regulation. So, what is the law? Vehicle loading cranes are not regulated by the Heavy Vehicle (Vehicle Standards) National Regulation (2020) or the Australian Design Rules. VLCs are seldom provided as an original vehicle equipment (OEM) option. Therefore, nearly all VLCs on Australian roads have been installed as a modification. The national heavy vehicle modification code, VSB6 is relevant (in participating jurisdictions). The relevant sections in VSB6 are: Section J1, Body Mounting and Section R1, Vehicle Mounted Lifting Systems. A modification plate showing these codes, that was issued by an Accredited Vehicle Examiner (AVE) is mandatory.

VSB6 Section J1 considers the strength of the mounting arrangement and whether the loads that the crane applies to the chassis (and outriggers) have adequate safety. Stabiliser legs are always needed, and two are integrated into the crane design by the manufacturer.

Note that wheels should remain on the ground when the stabilisers are deployed to restrain and anchor the vehicle. VSB6 Section R1 of VSB6 is applicable to vehicle loading cranes with a tonne-meter rating between 1 and 150mt. It requires that the crane comply with an Australian Standard AS1418 but does not specify the latest standard, which is dated 2014. VSB6 Section R1 specifies a minimum chassis strength Factor of Safety (FoS) of 3 generally and an FoS of 5 at point-load locations, such as the crane mount, based on vertical loading. Slewing cranes also produce torsional loads in the chassis that must be considered.

AS 1418.11:2014 is applicable to the crane module and not the installation. The stability requirement in VSB6 Section R1 is interpreted to be that the rated load never exceeds 80 per cent of the tipping load at every lifting position. Calculations are required. AS1418.11:2014 is aligned with the European Standard EN12999:2011, so European-manufactured cranes will likely be acceptable in Australia. Crane manufacturers always provide a load-reach diagram at the control panel. These diagrams are general and determined by the crane manufacturer, not the truck manufacturer. The installer must ensure that the truck is adequate for the loading chart.

Vehicle Loading Cranes that were manufactured over the past decade or so have an electronic supervision system that implements movements and limits crane operation. The controller receives information from the operator panel and sensors that monitor extension, slew angle, elevation and rope tension to implement the lift in a safe manner according to pre-programmed lifting



limits. It must be set-up by an accredited person. VLCs with an electronic controller will not tolerate overloading. Operators replacing an older non-supervised crane with a new one might need a higher rating to provide tolerance for marginal operating conditions. The supervisory system must be set-up by an accredited person when the crane is installed. State-of-the-art controllers also measure the weight on the stabiliser legs and their extension lengths. The crane stability may be actively

controlled. This will include derating or preventing lifting if the vehicle is tilted in any direction by more than the recommended maximum of five degrees. AS 2550.11:2016 has significant recommendations for VLC owners. It requires: 1 - an emergency stop at each control station; 2 - guards around hoses to protect the operator at each control station in the event of a hose rupture; 3 - burst valve protection at each cylinder; 4 - safety-related modifications recommended by the crane manufacturer to be implemented; 5 -

protections against the operator being crushed at the control station; 6 - a level indicator is needed at each fixed control station; 7 - stabiliser extensions must have a mechanical lock when being transported; 8 - a warning device must be installed in the cabin to indicate when the stabiliser extensions are not locked; 9 - controls must be identified; 10 - written operating instructions are needed; 11 - every year the crane must be examined by an accredited person; 12 - automatic protection and data logging are needed. AS 2550.11:2016 is not referenced in VSB6 Section R. However, it is referenced, in jurisdictional OH&S codes of practice. Work safety authorities will expect it to be followed by VLC operators; especially if something goes wrong. The AVE and crane assessor might also have to justify why a certificate was issued.

The operator of a VLC with a TM rating exceeding 10t-m must be licenced. The National Heavy Vehicle Inspection Manual, which identifies roadworthiness requirements, has no crane inspection requirements. The crane safety inspection requirements in AS2550.11:2016 are probably not mandated in regulations; however, OH&S regulations require cranes to be kept safe. Servicing according to AS2550.11:2016 or the crane manufacturer's recommendations for service inspections provides evidence of compliance. At the very least, crane operators should have the VLC serviced annually and should plan for a major service involving dismantling the crane and having it ultrasonically crack-tested every ten years. High-usage cranes require more frequent servicing. I am grateful to Jim Whittle of West-Trans for helping with this article.

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