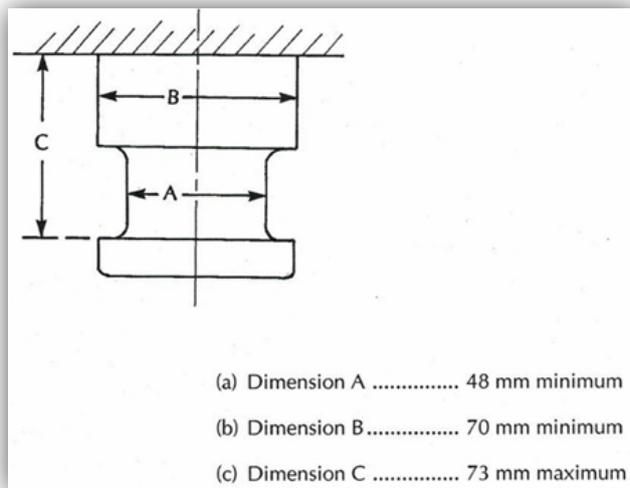


Kingpin and Skid Plate Safety and Security – Steve Bullôt

Since the Land Transport; Heavy Vehicles 2004 was amended to delete the requirement for fifth wheel kingpins to be crack tested or replaced at 100,000km there has been a noticeable increase in semi-trailer failures

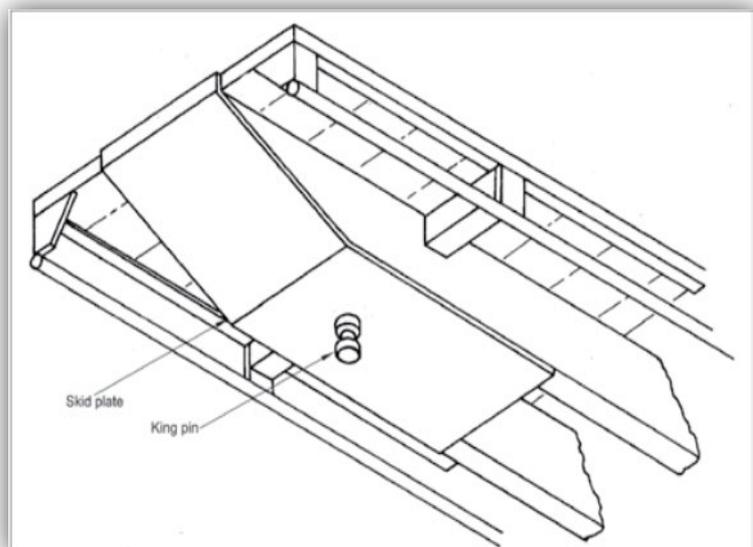
It is imperative to ensure that both the skid plate and kingpin are properly inspected and maintained as it is no longer possible for some critical tests to be done at CoF.



The kingpin is the critical single point of connection between the trailer and the tractor unit and must be in good condition, not damaged or bent and mounted square and not worn outside the dimensional limits as stated in the Standard NZS 5451 (Specification for Coupling Devices for Articulated Vehicles). Appropriate gauges should be used to check before completing form 4085B, The NZTA Operator statement of skidplate maintenance that must be presented when the vehicle is presented for a CoF. Note that this form must be correctly filled in and have been completed no more than 30 days/15,000 km prior

There are two types of kingpin, the weld in style and the bolt in type. There are a range of opinions on which is better. Weld in is stronger and easier at the manufacturing stage while the bolt in type makes replacement of the kingpin quicker and easier. A choice between easier manufacture or simpler maintenance.

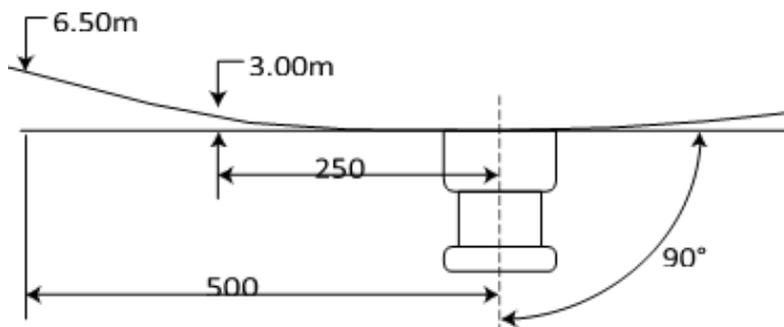
The skid plate, also known as the rubbing plate, is an integral part of the structure of the trailer that supports the kingpin. The skid plate should be designed so that it remains flat & level throughout the life of the trailer. If the skid plate buckles or warps outside the limits in the Standard then the kingpin may not locate in the jaws of the 5th wheel correctly and the combination could separate catastrophically. The design of the skid plate as part of the trailer should enable inspection of the kingpin mount, the structure of the skid plate and facilitate drainage so moisture is not trapped promoting corrosion. This may require the inclusion of inspection holes or an inspection hatch.



There are three common failure modes for a kingpin/skid plate;

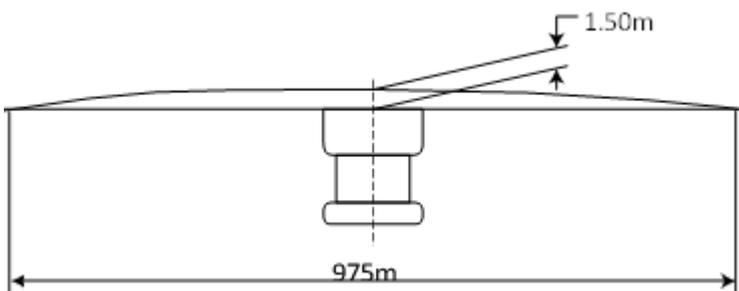
- Corrosion, caused by trapped moisture or road debris. This is basically a design fault that allows water and debris to accumulate and can be mitigated by regular cleaning.
- Cracking, wear or scoring of the skid plate. Cracking, which may be caused stress levels being exceeded (jackknifing etc), is an indication of end of life for the skid plate meaning it needs replacement. Wear could be caused by lack of lubrication and should also require the replacement of the skid plate while scoring, another reason to replace the skid plate, can be caused by foreign objects such as stones, getting between the fifth wheel and the skid plate.
- Distortion, this can be caused by the skid plate being worn, excessive loading, insufficient structural integrity, or poor design. In any case it is likely that distortion outside limits will require replacement of the skid plate.

The key to kingpin/skid plate safety is regular and careful inspection. The combination should be separated and cleaned then checked for corrosion, especially behind the skid plate. The skid plate should then be checked for cracking or damage and the supporting structure checked to ensure it is still fit for purpose.



The skid plate can then be checked for flatness against the requirements in the Standard and the kingpin checked for square and wear.

Note: that refrigerated and monocoque semi-trailers are at greatest risk of failure from corrosion, cracking or distortion due to the fact that the skid plate support structure is often difficult to inspect and it is easier for moisture & debris to collect behind the skid plate.



It is critical that there is a regular maintenance schedule when tractors and their semis are split for inspection. The use of the correct gauges to inspect for flatness of the skid plate and the squareness of kingpin is important as is keeping proper maintenance records that can provide a history of failure and repair and inform risk.

Images from NZS 5451:1989