Safety Chain Regulations – Words by RV Safe

Safety chains are required for all trailers, and trailers with an aggregate trailer mass (ATM) over 2500kg, require two chains. Whilst most know they need to connect these chains to their vehicles; many don't realise that the type of chain and shackle used matters.

Safety Chains

For a trailer with an ATM of up to 3,500kg, chains need to meet the requirements of AS4177.4 or have a cable which is appropriate for the application.

For a trailer with an ATM exceeding 3,500kg, a steel chain with a minimum of 800 MPa breaking stress conforms to the mechanical properties of a Grade T chain as specified in AS2321 is required.

The chain must be permanently attached to the trailer, they cannot be shackled. Below 3,500kg ATM, the chain can be welded to the drawbar with the weld forming 50% of the circumference of the link but the first link in the chain must have unfettered movement.

Once above the 3,500kg ATM then you need to use rated pin lock couplings. No welding is permitted. Placement needs to be practical, and if two points of attachment are needed, then you must place one on either side of the drawbar's centre line.

Safety chains must be stamped with the chain's capacity, the manufacturer's identification, and the digits 4177.

AS4177 requires steel safety chains by the following:

- Up to 1.0 tonne, a chain size of 6.3mm.
- Up to 1.6 tonnes, a chain size of 8mm.
- Up to 2.5 tonnes, a chain size of 10mm.
- Up to 3.5 tonnes, a chain size of 13mm.

Your safety chains should not be so long that they reach the ground. If two are required, they should be crossed under the coupling so that in the event of the trailer decoupling, it should fall and be caught by the chains. They also cannot be too short that you are unable to make tight turns.

If your chains are not long enough, you can extend them with a Hammerlock by cutting the current chain so that one welded link stays attached to the trailer and attaching a new longer chain with the Hammerlock. Note – you cannot make the chain longer with additional D or bow shackles. Only one of these per chain is permitted and is used to attach the chain to the vehicle.

Shackles

Safety chains may be attached to the towbar attachment points with a Bow, D or Pin-shackle and are subject to the performance requirements per ADR 62/01 or 02 – Mechanical Connections between Vehicles.

Types of shackles:

BOW-SHACKLE – "O" shaped body that is enclosed at the end by either a threaded clevis or cotter pin and used to connect a safety chain between a road motor vehicle and road trailer.

D-SHACKLE – "U" shaped body that is enclosed at the end by either a threaded clevis or cotter pin and used to connect a safety chain between a road motor vehicle and road trailer.

PIN-SHACKLE – a device integral to a tow bar, which may consist of brackets and a bolt, clevis or cotter pin and used to connect a safety chain between a road motor vehicle and road trailer

Circular 0-1-3 "Safety chain connection devices for road trailer which are up to 3.5 tonnes (3,500kg) aggregate trailer mass (ATM) provides:

"Bow-Shackles and D-Shackles that comply with Australian Standard (AS) 2741 are rated for lifting applications and have a breaking load marked on the shackle that is higher than the Working Load Limit (WLL). Since the loading on these shackles is different when used to attach a safety chain to a road vehicle as compared to when used in lifting applications, a road trailer may be towed that is heavier than the shackle's WLL."

Everything you need to know about a shackle should be stamped on it. This includes its working load limit (WWL), manufacturer name or trademark, grade stamp and identification marking in order to correlate shackle to test certificate.

The shackle needs a break limit that is 1.5 times the ATM of your trailer. Generally, the break load limit of a rated shackle will be six times greater than its WLL.

Typical shackles recommended based on trailer ATM:

Trailer ATM (kg)	For Bow or D-Shackles complying with AS 2741			
	Minimum shackle Working Load Limit (WLL) (kg)	Minimum size of shackles (Body diameter, not pin size)		
		Grade M (or 4) D-Shackle (mm)	Grade S (or 6) D-Shackle (mm)	Grade S (or 6) Bow-Shackle (mm)
0-1,000	250	6	6	5
1,001-1,600	400	10	6	6
1,601-2,500	625	13	8	8
2,501-3,500	875	16	10	10

A new style of shackle has also come to market that is of a hook style to make connecting easier. As long as the hook is stamped correctly and compliant with AS4177, this can be used in place of a D or bow shackle. Circular 0-1-3 does make it clear that “there is no legal obligation to follow this material, it is the responsibility of the person or the company to demonstrate to state or territory road authorities that a particular safety chain connection device is appropriate for the combination vehicle.”

Finally, despite what you may have read online, the shackles can be any colour.