Government of **Western Australia**
Department of **Transport**
Driver and Vehicle Services

CI-119C

Vehicle Safety and Standards
Circular to Industry

Safety Chains and Shackles for Trailers under 4.5 tonnes ATM built after 1991

Introduction

All new trailers that are presented for licensing must comply with the requirements of Vehicle Standard Bulletin - *Building Small Trailers (VSB1)*. VSB1 summarises the construction requirements for caravans and trailers necessary to meet the Australian Design Rules (ADRs), and trailers built to meet the requirements in this bulletin are accepted as meeting the ADRs. The chain requirements are specified in ADR 62.

VSB1 stipulates that marked safety chain must be used. This particular requirement had been relaxed to some extent when it was difficult to source chain that met the required standards. Suitable chain is now widely available and this requirement will be enforced for new trailers.

Trailers under 2500 kg ATM must be fitted with at least one chain - trailers over 2500 kg ATM must be fitted with two chains.

For trailers up to 3500 kgs ATM (steel chain to AS4177)

Chain used in trailers up to 3500 kgs ATM must comply with Australian Standard *AS4177 Caravan and light trailer towing components - Part 4 Safety chains up to 3500 kg capacity*. The size of chain according to trailer ATM is specified in Table 1 below.

If the chain is to be welded to the drawbar, the weld must cover at least 50% of the length of the link and the adjoining link must be able to move freely within the welded link. Alternatively a plate may be welded to the drawbar and suitably rated fittings such as *Hammerlock* fittings may be employed.

Markings

Complying chain is permanently and legibly marked with the manufacturer's or importer's identification and the digits 4177 (i.e. the number of this Australian Standard), followed by a hyphen and the first two digits of the chain load designation.

For example, chain with a breaking load of 2500 kg will be marked 4177-25.

The marking on complying chain is repeated at intervals not exceeding 4 links and the characters on the links are at least 1.5 mm high for chains less than 8 mm link diameter, and not less than 2 mm high for chains 8 mm and above.

Table 1: Diameter of link material and maximum load capacity

Aggregate trailer mass	Chain size (dia. of link material)	Marking on chain	Minimum chain breaking load
0 to 1000 kg	6.3 mm	4177-10	1000 kg
Up to 1600 kg	8 mm	4177-16	1600 kg
Up to 2500 kg	10 mm	4177-25	2500 kg
Up to 3500 kg	13 mm	4177-35	3500 kg

For trailers over 3.5 tonne ATM (short link chain to AS 2321)

Safety chains for trailers over 3.5 tonne must be made from steel with a minimum 800 MPa breaking stress and conforming with the mechanical properties of grade T chain as specified in *AS2321 Short Link Chain for Lifting Purposes (non calibrated).*

Drawbar attachment

The chain must be permanently attached to the trailer, shackles are not permitted.
This chain **must not** be welded to the draw bar. It may be attached to a plate that is welded to the drawbar or by an appropriate pin lock device such as a hammerlock or other acceptable type of suitably rated coupling. The design of the attachment to the drawbar must have sufficient load capacity to match the rating of the required chain as specified in Table 2 below.

Towbar attachment

Rated chain shackles or other suitable fittings must have sufficient load capacity to match the rating of the required chain as specified in Table 2 below.

Table 2: Diameter of link material and maximum load capacity

Aggregate trailer mass (tonnes)	Chain size (millimetres)	Minimum chain breaking load (tonnes)
Over 3.5 and up to 4.3	7.1	6.4
Over 4.3 and up to 7.5	9.5	11.6

Markings

Complying short link chain is permanently and legibly marked with the manufacturer's or the importer's identification marking preceding the letter "T" or the numbers "8" or "80" or "800". This marking should appear on at least every 20 links.

Note

All previously licensed (registered) trailers are acceptable with chains that were originally supplied at the time of licensing providing they are in good condition, appropriately sized and are safely secured to the trailer.

Light Trailer Safety Chain Shackles

Purpose

The purpose of this Bulletin is to provide guidance on the selection of suitable shackles to connect light trailer safety chains to the safety chain attachment points on the towbar of the towing vehicle. A light trailer is a trailer with an Aggregate Trailer Mass (ATM) up to 3.5 Tonnes.

Background

Regulation 366 Road Traffic (Vehicles) Regulations 2014 "*Drawbar Couplings*" of the Australian Vehicle Standards Rules requires that a trailer is kept in tow by a safety connection device if the tow coupling breaks or accidentally detaches from the towing vehicle.

A safety connection device includes a trailer safety chain or cable as outlined in Australian Design Rule (ADR) 62/02 "*Mechanical Connection Between Vehicles*". For trailers with an Aggregate Trailer Mass (ATM) up to 3500kg, ADR 62/02 requires compliance with Australian Standards AS 4177 "*Caravan and light trailer towing components*". For trailers with an ATM over 3500kg, compliance with Australian Standards AS 2321 "*Short-link chain for lifting purposes*" is applicable.

Policy

A suitable shackle is where:

a) The shackle is rated and complies with Australian Standard AS 2741-2002 "Shackles" or other equivalent recognised standard; and

b) The break load limit of the shackle is rated at least 1.5 times greater than the ATM of the trailer.

Example

Trailer ATM	**Shackle Rating** (break load limit at least 1.5 times ATM)
750kg	1125kg
1000kg	1500kg

Requirement

Markings complying with AS 2741-2002 *"Shackles"* shall be legibly and permanently marked with the following information:

a) The manufacturer's name or trademark;

b) Quality grade of the shackle, e.g ("M" or "4", "S" or "6");

c) Working load limit (WLL) or Rating; and

d) Identification marking in order to correlate shackle to test certificate.

Note

i. Generally, the break load limit of a rated shackle will be six times greater than its work load limit.

ii. Pin diameter of shackle will be greater than the diameter of the main shackle body.

iii. Same size shackles of different quality grades will have a different WLL (i.e 6mm "S" grade shackle has a greater WLL than a 6mm "M" grade shackle).

iv. Stainless steel shackles are unsuitable for trailer use due to the material's general low resistance to bending stresses.

v. "S" or "6" grade "D" shackles bear similar characteristics to "S" or "6" grade Bow shackles.

vi. Bow shackles provide for greater angular usage compared with "D" shackles.

vii. Rated bolts, chain shackles or other suitable fittings (i.e hammerlocks) may be used as devices for connection on safety chains providing the break load limit of the device is at least 1.5 times greater than the ATM of the trailer.

viii. Shackle Matrix – refer Appendix A

Action

Where non-compliance of a safety chain connection device (i.e shackle) has been detected, Department of Transport examiners and Authorised inspectors are to alert the driver of the towing vehicle on the requirement to have a suitably rated device.

References

Australian Design Rule (ADR) 62/02 "*Mechanical Connection Between Vehicles*" -

http://www.infrastructure.gov.au/roads/motor/design/adr_online.aspx

National Code of Practice - Vehicle Standards Bulletin 1 "*Building Small Trailers*" -

http://www.infrastructure.gov.au/roads/vehicle_regulation/bulletin/vsb1/index.aspx

Appendix A			
Shackle Matrix (Guide Only)			
Nominal Shackle Size (mm)	**Work Load** (kg)	**Break Load** (kg)	**Quality Grade Marking**
5	330	1987	“S” or “6”
6	250	1508	“M” or “4”
6	500	3007	“S” or “6”
8	750	4505	“S” or “6”
10	500	3007	“M” or “4”
10	1000	6004	“S” or “6”
11	1500	9001	“S” or “6”
13	750	4505	“M” or “4”
13	2000	12040	“S” or “6”
16	1500	9010	“M” or “4”
16	3200	19285	“S” or “6”
19	2000	12040	“M” or “4”
19	4700	28265	“S” or “6”

Related documents and links

- Vehicle Standard Bulletin - Building Small Trailers (VSB1) is available on the Department of Infrastructure and Regional Development website (www.infrastructure.gov.au)
- Australian Design Rules are available on the Department of Infrastructure and Regional Development website (www.infrastructure.gov.au)
- Standard AS 4177 can be accessed through the Standards Australia website (www.standards.org.au)

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