



Vehicle Standard (Australian Design Rule 62/02 – Mechanical Connections Between Vehicles) 2007

I, JAMES ERIC LLOYD, Minister for Local Government, Territories and Roads,
determine this vehicle standard under subsection 7 (1) of the *Motor Vehicle Standards
Act 1989*.

Dated 29th June 2007

[SIGNED]

James Eric Lloyd

Minister for Local Government, Territories and Roads

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0. LEGISLATIVE PROVISIONS**0.1. NAME OF STANDARD**

0.1.1. This Standard is the Vehicle Standard (Australian Design Rule 62/02 – Mechanical Connections Between Vehicles) 2007.

0.1.2. This Standard may also be cited as Australian Design Rule 62/02 — Mechanical Connections Between Vehicles.

0.2. COMMENCEMENT

0.2.1. This Standard commences on the day after it is registered.

1. SCOPE

The function of this vehicle standard is to specify requirements for devices for mechanical connections between vehicles and their fitment, in order to ensure positive mechanical engagement for vehicle combinations and to prohibit the opening or disengaging of devices under the action of any forces to which they may be subject to during normal use.

2. APPLICABILITY

2.1. This vehicle standard is only applicable to vehicles fitted with '*Couplings*' that are designed to be separated in normal operation; and

2.2. does not apply to connection devices mounted to the front of a motor vehicle or devices not intended for towing trailers.

2.3. This vehicle standard applies to the design and construction of L, M, N and T category vehicles from the dates set out in clauses 2.3.1, 2.3.2, and the table below.

2.3.1. 1 January 2009 on all new model vehicles.

2.3.2. 1 July 2009 on all vehicles.

2.3.3. For the purposes of clause 2.3.1 a "new model" is a vehicle model first produced with a '*Date of manufacture*' on or after the agreed date in clause 2.3.1.

2.4. Applicability Table

Vehicle Category	ADR Category Code *	UNECE Category Code *	Manufactured on or After	Acceptable Prior Rules
Moped 2 wheels	LA	L1	1 January 2009**	/01
Moped 3 wheels	LB	L2	1 January 2009**	/01
Motor cycle	LC	L3	1 January 2009**	/01
Motor cycle and sidecar	LD	L4	1 January 2009**	/01
Motor tricycle	LE	L5		
	LEM		1 January 2009**	/01
	LEP		1 January 2009**	/01
	LEG		1 January 2009**	/01
Passenger car	MA	M1	1 January 2009**	/01
Forward-control passenger vehicle	MB	M1	1 January 2009**	/01
Off-road passenger vehicle	MC	M1	1 January 2009**	/01
Light omnibus	MD	M2	1 January 2009**	/01
up to 3.5 tonnes 'GVM' and up to 12 seats	MD1			
up to 3.5 tonnes 'GVM' and more than 12 seats	MD2			
over 3.5 tonnes and up to 4.5 tonnes 'GVM'	MD3			
over 4.5 tonnes and up to 5 tonnes 'GVM'	MD4			
Heavy omnibus	ME	M3	1 January 2009**	/01
Light goods vehicle	NA	N1	1 January 2009**	/01
Medium goods vehicle	NB	N2	1 January 2009**	/01
over 3.5 tonnes up to 4.5 tonnes 'GVM'	NB1			
over 4.5 tonnes up to 12 tonnes 'GVM'	NB2			
Heavy goods vehicle	NC	N3	1 January 2009**	/01
Very light trailer	TA	O1	1 January 2009**	/01
Light trailer	TB	O2	1 January 2009**	/01
Medium trailer	TC	O3	1 January 2009**	/01
Heavy trailer	TD	O4	1 January 2009**	/01

** See clauses 2.3.1 to 2.3.3

* UN ECE Vehicle Categories are provided for information and as reference only. The category code may also be in the format L₁, L_A etc.

3. DEFINITIONS

- 3.1. For vehicle categories, definitions and meanings used in this standard, refer to Vehicle Standard (Australian Design Rule Definitions and Vehicle Categories) 2005.

4. REQUIREMENTS

- 4.1. All '*Couplings*' must comply with the requirements of this standard.
- 4.2. Installation of '*Couplings*' is:
- 4.2.1. Mandatory on all trailers for '*Couplings*' which connect to the towing vehicle; and
- 4.2.2. optional for all other motor vehicles.

5. GENERAL APPLICATION REQUIREMENTS

- 5.1. '*Couplings*' designed for use between tow vehicles and trailers with an '*ATM*' up to 3.5 tonnes must be '*Quick Release Couplings*'.

6. '*FIFTH WHEEL ASSEMBLIES*'

- 6.1. '*Fifth Wheel Assemblies*' that have a '*D-value*' rating of greater than 40 kN must comply with and be installed to comply with the requirements of AS/NZS 4968.1:2003 Heavy-road vehicles – Mechanical coupling between articulated vehicle combinations – Design criteria and selection requirements for fifth wheel, kingpin and associated equipment¹; and
- 6.1.1. AS/NZS 4968.2:2003 Heavy-road vehicles – Mechanical coupling between articulated vehicle combinations – Testing and installation of fifth wheel and associated equipment.
- 6.2. '*Fifth Wheel Assemblies*' that have a '*D-value*' rating of 40 kN or less must meet clause 6.1; or
- 6.2.1. meet the static strength test requirements in clause 12.3.2 or the dynamic strength test requirements of clause 12.3.3; and
- 6.2.2. meet the marking requirements of clause 12.4 or of AS/NZS 4968.1:2003.

7. KINGPINS FOR '*FIFTH WHEEL ASSEMBLIES*'

- 7.1. Kingpins that have a '*D-value*' rating of greater than 40 kN must comply with and be installed to comply with the requirements of AS/NZS 4968.1:2003 Heavy-road vehicles – Mechanical coupling between articulated vehicle combinations – Design criteria and selection requirements for fifth wheel, kingpin and associated equipment¹; and
- 7.1.1. AS/NZS 4968.3:2003 Heavy-road vehicles – Mechanical coupling between articulated vehicle combinations – Kingpins and associated equipment¹.

¹ Determination of the '*D-value*' in clause 6 of AS/NZS 4968.1:2003 and clause 7 of AS/NZS 4968.3:2003 is relevant to vehicle combinations only and so is not required under this Vehicle Standard (Australian Design Rule 62/02 – Mechanical Connections Between Vehicles) 2007.

- 7.1.2. The marking requirements of clause 12.4 may be used instead of those in AS/NZS 4968.1:2003.
- 7.2. Kingpins that have a '*D-value*' rating of 40 kN or less must meet clause 7.1; or
- 7.2.1. meet the static strength test requirements in clause 12.3.2 or the dynamic strength test requirements of clause 12.3.3; and
- 7.2.2. meet the marking requirements of clause 12.4 or of AS/NZS 4968.1:2003.
- 7.2.3. Where a kingpin has been tested to clause 12.3.3, it must be installed such that the installation will withstand a static longitudinally applied force equal to a minimum of the '*D-value*' for 60 seconds duration without separation. This requirement may be demonstrated using '*Approved*' calculations, where the calculations take into account both strength and fatigue resistance.
- 7.3. '*Skid-Plate*' assemblies of '*Semi-Trailers*' of TD category must comply with AS/NZS 4968.3:2003 and must be designed with provision for draining the water from the space above the '*Skid Plate*'.
- 8. 40 mm AND 50 mm '*AUTOMATIC PIN COUPLINGS*'**
- 8.1. 40 mm and 50 mm '*Automatic Pin Couplings*' must comply with the requirements of AS 2213 – 2001 Commercial road vehicles – Mechanical connections between towing vehicles parts 1 and 2²; and
- 8.1.1. AS2213 - 1998 Commercial road vehicles – Mechanical connections between towing vehicles parts 3 to 5.
- 8.1.2. The value of 'a' used in clause 7 of AS 2213 – 2001 part 1, must be = 2.4.
- 8.1.3. The marking requirements of clause 12.4 may be used instead of those in AS 2213 - 2001.
- 9. 50 mm '*BALL COUPLINGS*'**
- 9.1. 50 mm '*Ball Couplings*' intended for towing trailers with an '*ATM*' of up to 3.5 tonnes must comply with the requirements of AS 4177.2 – 2004 50mm Towballs.
- 9.1.1. The marking requirements at clause 12.4 may be used instead of those in AS 4177.2 – 2004.
- 10. '*COUPLING*' BODIES FOR 50 mm '*BALL COUPLINGS*'**
- 10.1. '*Coupling*' bodies for 50 mm '*Ball Couplings*' intended for towing trailers with an '*ATM*' of up to 3.5 tonnes must comply with the requirements of AS 4177.3 – 2004 Coupling Body for Ball Couplings.

² Determination of the '*D-value*' in clause 6 of AS 2213.1– 2001 and determination of the '*V-value*' for the towing vehicle in clause 7 is relevant to vehicle combinations only and so is not required under this Vehicle Standard (Australian Design Rule 62/02 – Mechanical Connections Between Vehicles) 2007.

- 10.1.1. The marking requirements at clause 12.4 may be used instead of those in AS 4177.3 – 2004.

11. 'HOOK COUPLINGS'

- 11.1. The hook part of '*Hook Couplings*' must comply with the technical requirements of the standard referenced in clause 15.1.9; or
- 11.2. the dimensional requirements of the standard referenced in clause 15.1.9; and
- 11.2.1. clauses 12.2 - 12.4, except for clause 12.4.2.2.
- 11.3. The towing ring part of '*Hook Couplings*' must comply with the technical requirements of the standard referenced in clause 15.1.10; or
- 11.4. the dimensional requirements of the standard referenced in clause 15.1.10; and
- 11.4.1. clauses 12.2 - 12.4 except for clause 12.4.2.2.
- 11.5. '*Hook Couplings*' must comply with the '*Coupling*' manufacturer's installation instructions when fitted to a towing or towed vehicle.
- 11.6. For information purposes, a copy of the relevant dimensions referenced at clauses 11.2 and 11.4 are shown in APPENDIX 1.

12. OTHER 'COUPLINGS'

- 12.1. '*Couplings*' other than those specified in clauses 6 to 11 must comply with clauses 12.2 to 12.4 and must comply with the '*Coupling*' manufacturer's installation instructions when fitted to a towing or towed vehicle.

12.2. Locking Mechanism

- 12.2.1. '*Couplings*' must incorporate a positive locking mechanism together with a separate means of retaining this mechanism in the locked position. The locking must be readily verifiable by visual examination.
- 12.2.2. '*Quick Release Couplings*' must incorporate a positive locking mechanism together with a separate means of automatically retaining this mechanism in the locked position. This locking must be readily verifiable by visual examination.

12.3. Strength

12.3.1. Up to 750kg 'ATM'

'*Couplings*' specifically designed for use between LA, LB, LC, LD category and LEM sub-category towing vehicles and trailers up to 750kg 'ATM' when installed in the design configuration must withstand the relevant static or dynamic forces nominated in clause 12.3.1.1 or clause 12.3.1.2 when these forces are applied separately at the intended '*Coupling*' centreline, without incurring any residual deformation that would interfere or degrade the function of the assembly or any breaks, cracks or separation of components. The static forces must be maintained for not less than 10 seconds.

12.3.1.1. Up to 750kg 'ATM' – Static Testing

- 12.3.1.1.1. Longitudinal tension and compression of minimum (N) $1.5 \times 9.81 \times$ 'ATM' (kg) for the 'ATM' at which the 'Coupling' is rated; and
- 12.3.1.1.2. Transverse thrust of minimum (N) $0.5 \times 9.81 \times$ 'ATM' (kg) for the 'ATM' at which the 'Coupling' is rated.

12.3.1.2. Up to 750kg 'ATM' – Dynamic Testing

- 12.3.1.2.1. Horizontal alternating force of minimum +/- 2.52 kN acting in a line parallel to the ground and in the longitudinal median plane of the towing vehicle for at least 2 million cycles. The frequency is not to exceed 35 Hz, and must be chosen so as not to coincide with any natural frequency of the system.

12.3.2. Up to 3.5 tonnes 'ATM'

'Couplings', other than those at clause 12.3.1, specifically designed for use between towing vehicles and trailers up to 3.5 tonnes 'ATM' when installed in the design configuration must withstand the relevant static or dynamic forces nominated in clause 12.3.2.1 or clause 12.3.2.2 when these forces are applied separately at the intended 'Coupling' centreline, without incurring any residual deformation that would interfere or degrade the function of the assembly or any breaks, cracks or separation of components. The static forces must be maintained for not less than 10 seconds.

12.3.2.1. Up to 3.5 tonnes 'ATM' – Static Testing

- 12.3.2.1.1. Longitudinal tension and compression of minimum (N) $1.5 \times 9.81 \times$ 'ATM' (kg) for the 'ATM' at which the 'Coupling' is rated; and
- 12.3.2.1.2. Transverse thrust of minimum (N) $0.5 \times 9.81 \times$ 'ATM' (kg) for the 'ATM' at which the 'Coupling' is rated; and
- 12.3.2.1.3. Vertical tension and compression of minimum (N) $0.5 \times 9.81 \times$ 'ATM' (kg) for the 'ATM' at which the 'Coupling' is rated.

12.3.2.2. Up to 3.5 tonnes 'ATM' – Dynamic Testing

- 12.3.2.2.1. Horizontal alternating force of minimum +/- 12 kN acting in a line parallel to the ground and in the longitudinal median plane of the towing vehicle for at least 2 million cycles. The frequency is not to exceed 35 Hz, and must be chosen so as not to coincide with any natural frequency of the system.

12.3.3. Over 3.5 tonnes 'ATM'

'Couplings' specifically designed for use between towing vehicles and trailers over 3.5 tonnes 'ATM' when installed in the design configuration must withstand the relevant 'D-value', or the relevant 'D-value' and 'V-value' dynamic forces nominated in clause 12.3.3.1 or clause 12.3.3.2 when these forces are applied separately at the intended 'Coupling' centreline, without incurring any residual deformation that would interfere with or degrade the function of the assembly or any breaks, cracks or separation of components.

12.3.3.1. Over 3.5 tonnes 'ATM' – 'D-value' rated Dynamic Testing

12.3.3.1.1. Horizontal alternating force of minimum (kN) $\pm 0.6 \times$ 'Coupling' 'D-value' (kN) acting in a line parallel to the ground and in the longitudinal median plane of the towing vehicle for at least 2 million cycles. The frequency is not to exceed 35 Hz, and must be chosen so as not to coincide with any natural frequency of the system.

12.3.3.2. Over 3.5 tonnes 'ATM' – 'D-value' and 'V-value' rated Dynamic Testing

12.3.3.2.1. Horizontal alternating force of minimum (kN) $\pm 0.6 \times$ 'Coupling' 'D-value' (kN) acting in a line parallel to the ground and in the longitudinal median plane of the towing vehicle and a vertical alternating force of minimum (kN) static vertical 'Coupling' load $\pm (0.6 \times$ 'Coupling' 'V-value' (kN)) acting vertically for at least 2 million cycles. The frequency is not to exceed 35 Hz, and must be chosen so as not to coincide with any natural frequency of the system.

The static vertical 'Coupling' load (kN) = $9.81 \times S$

where: $S =$ 'ATM' - 'GTM' (tonnes).

12.3.3.2.2. The horizontal and vertical alternating forces must be sinusoidal in shape and must be applied asynchronously so that the difference in their frequencies shall be between 1% and 3%.

12.4. Marking**12.4.1. Up to 3.5 tonnes 'ATM'**

Both parts of a 'Coupling' specifically designed for use between LA, LB, LC, LD category and sub category LEM towing vehicles and trailers up to 750kg 'ATM', or specifically designed for use between towing vehicles and trailers up to 3.5 tonnes 'ATM' must be marked with the following information:

12.4.1.1. The 'Coupling' manufacturer's name or trademark; and

12.4.1.2. the maximum allowable trailer 'ATM' and its units of measurement, kg for an 'ATM' up to 750 kg and tonnes otherwise), at which the 'Coupling' is rated; and

12.4.1.3. the words "use with model (identified model)".

12.4.2. Over 3.5 tonnes 'ATM'

Both parts of the 'Coupling' specially designed for use between towing vehicles and trailers over 3.5 tonnes 'ATM' must be marked with the following information:

12.4.2.1. The 'Coupling' manufacturer's name or trademark; and

12.4.2.2. the words "use with model (identified model)"; and

12.4.2.3. either the rated 'D-value', or the rated 'D-value' and 'V-value' (kN).

12.4.3. All markings must be stamped, moulded or printed with letters not less than 2.5mm high and must be visible when the 'Coupling' is installed

and connected. The markings may be on a metal plate that is permanently affixed to the '*Coupling*' or to the vehicle adjacent to the '*Coupling*'.

13. **'TOWBARS'**

13.1. **Up to 3.5 tonnes 'ATM'**

For vehicles with a maximum rated towing capacity of up to 3.5 tonnes '*ATM*', the '*Towbar*' towing bracket, towbar attachment and vehicle structure must comply with the requirements of AS 4177.1 - 2004 Towbars and towing brackets.

13.2. **Over 3.5 tonnes 'ATM'**

For vehicles with a maximum rated towing capacity of over 3.5 tonnes '*ATM*', the '*Towbar*' towing bracket, towbar attachment and vehicle structure must comply with clauses 13.3 – 13.5.

13.3. **'Towbars' – Over 3.5 tonnes 'ATM' – Strength**

For vehicles with a maximum rated towing capacity of over 3.5 tonnes '*ATM*', the '*Towbar*' towing bracket, towbar attachment and vehicle structure must withstand the relevant static or dynamic forces nominated in clauses 13.3.1 or 13.3.2, according to their maximum rated capacity, when these forces are applied separately at the intended '*Coupling*' centreline without incurring any residual deformation that would interfere or degrade the function of the assembly or any breaks, cracks and separation of components. The static forces must be maintained for not less than 10 seconds. Alternatively approval may be by '*Approved*' calculations as per clause 13.3.3.

13.3.1. **'Towbars' – Over 3.5 tonnes 'ATM' - Static Testing**

13.3.1.1. **Longitudinal Tension and Compression**

13.3.1.1.1. For vehicles towing trailers up to 23.5 tonnes '*ATM*', other than '*Converter Dollies*' a (N) $1.5 \times 9.81 \times \text{'ATM'}$ (kg) for the '*ATM*' at which the '*Towbar*' is rated.

13.3.1.1.2. For vehicles towing trailers over 23.5 tonnes '*ATM*', and '*Converter Dollies*' the greater of 350 kN; or

13.3.1.1.3. $2.25 \times \text{'Coupling' 'D-value'}$ (kN) for the '*Coupling*' '*D-Value*' at which the '*Towbar*' is rated.

13.3.1.2. **Transverse Thrust**

13.3.1.2.1. For all vehicles towing trailers, 120kN. Alternatively, the following may be used:

13.3.1.2.1.1. (N) $0.5 \times 9.81 \times \text{'ATM'}$ (kg) for the '*ATM*' at which the '*Towbar*' is rated; or

13.3.1.2.1.2. For a '*Towbar*' marked for towing '*Dog Trailers*', as per clause 13.5.1.4, (N) $0.5 \times 9.81 \times [\text{'GGALR'}$ (kg) for the front '*Axle Group*' of the designated '*Dog Trailer*'].

13.3.1.2.1.3. Notwithstanding the requirements at clauses 13.3.1.2.1.1 and 13.3.1.2.1.2, it need not be greater than (N) $\{[\text{'Wheelbase'}$ (m) +

$\{ \text{'Coupling' Offset (m)} / \text{'Wheelbase' (m)} \} \times [\text{sum of the 'Axle Loads' (kg) for the rear 'Axle Group' of the towing vehicle when at 'GVM'}]$.

where: *'Coupling' Offset* is the dimension from the rear wheel centrelines of the towing vehicle (as used to determine the *'Wheelbase'*) to the centre of the *'Coupling'* (m).

13.3.1.3. Vertical Tension and Compression

13.3.1.3.1. For all vehicles towing trailers, 120kN. Alternatively, the following may be used:

13.3.1.3.1.1. (N) $0.5 \times 9.81 \times \text{'ATM'}$ (kg) for the *'ATM'* at which the *'Towbar'* is rated; or

13.3.1.3.1.2. For a *'Towbar'* marked for towing *'Dog Trailers'*, as per clause 13.5.1.4, (N) $0.5 \times 9.81 \times [\text{'GGALR'}$ (kg) for the front *'Axle Group'* of the designated *'Dog Trailer'*].

13.3.1.3.1.3. Notwithstanding the requirements at clauses 13.3.1.3.1.1 and 13.3.1.3.1.2, for vehicles towing trailers with hinged *'Drawbars'* only, it need not be greater than +/- 10 kN.

13.3.2. *'Towbars' – Over 3.5 tonnes 'ATM' – Dynamic Testing*

13.3.2.1. Horizontal alternating force of minimum (kN) +/- $0.6 \times \text{'Coupling' 'D-value'}$ (kN), for the *'Coupling' 'D-value'* at which the *'Towbar'* is rated, acting in a line parallel to the ground and in the longitudinal median plane of the towing vehicle and a vertical alternating force of (kN) +/- $0.18 \times 9.81 \times \text{'ATM'}$ (tonne), for the *'ATM'* at which the *'Towbar'* is rated, acting vertically for at least 2 million cycles. The frequency is not to exceed 35 Hz and must be chosen so as not to coincide with any natural frequency of the system.

13.3.2.2. The horizontal and vertical alternating forces must be sinusoidal in shape and must be applied asynchronously so that the difference in their frequencies shall be between 1% and 3%.

13.3.3. *'Towbars' – Over 3.5 tonnes 'ATM' – 'Approved' Calculations*

The strength of a *'Towbar'* may be demonstrated for loads as per clauses 13.3.1 and 13.3.2 by *'Approved'* calculation procedures where the calculations take into account both strength and fatigue resistance.

13.4. *'Towbars' – Over 3.5 tonnes 'ATM' – Safety Chain Attachments*

13.4.1. Except for vehicles designed for use in *'Road Trains'*, the *'Towbar'* must be fitted with two safety chain attachments, mounted either side of and adjacent to, the tow *'Coupling'*.

13.4.2. Each safety chain attachment provided on the *'Towbar'* must withstand at least the following static forces, separately applied, without incurring any residual deformation that would interfere or degrade the function of the assembly or any breaks, cracks or separation of components. The static forces must be maintained for not less than 10 seconds:

13.4.2.1. Longitudinal tension in accordance with clause 13.3.1.1; and

13.4.2.2. vertical tension in accordance with clause 13.3.1.3.

- 13.4.3. 'Towbar' safety chain attachments must be fixed to a part of the 'Towbar' which is permanently attached to the vehicle. Means of permanent attachment include at least either welding or bolting.
- 13.5. 'Towbars' – Over 3.5 tonnes 'ATM' – Marking**
- 13.5.1. Except where an integral part of the vehicle the 'Towbar' must be marked with the following information:
- 13.5.1.1.** The 'Towbar' manufacturer's name or trade mark; and
- 13.5.1.2.** the "make and model" shown on the 'Compliance Plate' or trailer plate fitted to the vehicle for which it is designed, or the manufacturer's part number; and
- 13.5.1.3.** The maximum rated capacity at which the 'Towbar' is rated and which must not exceed the vehicle manufacturer's rated capacity. This must be the 'ATM' in tonnes where determined using the static requirements of clause 13.3.1, or the maximum 'Coupling' 'D-value' in kN where determined using the dynamic requirements of clause 13.3.2. In addition, where the maximum rated capacity has been determined using clause 13.3.1.1.3 the maximum 'Coupling' 'D-value' must form part of the required markings.
- 13.5.1.4.** Notwithstanding the requirements of clause 13.5.1.3, where the transverse thrust has been determined using clause 13.3.1.2.1.2 or the vertical tension and compression has been determined using clause 13.3.1.3.1.2, the maximum rated capacity marked must not exceed the 'GGALR' for the front 'Axle Group' in tonnes at which the 'Towbar' is rated. However, the 'Towbar' may carry all of the following additional marking:
- "Dog Trailers Only ATM = (the maximum rated capacity without regard to the 'GGALR' for the front 'Axle Group' in tonnes at which the 'Towbar' is rated)"; and
- "Front Axle Group Load Limit = ('GGALR' for the front 'Axle Group' in tonnes at which the 'Towbar' is rated)".
- 13.5.1.5.** Where the vertical tension and compression has been determined using clause 13.3.1.3.1.3, the 'Towbar' must also be marked with "Hinged Drawbar Only".
- 13.5.1.6.** All markings must be stamped, moulded or printed with letters not less than 6 mm high. Where the information required at clause 13.5.1 is not visible when the 'Towbar' is fitted to the vehicle, an additional plate clearly and permanently marked and in a conspicuous position must be affixed to the vehicle adjacent to the 'Towbar' showing the maximum rated capacity of the 'Towbar' and the information required by clause 13.5.1.4 and 13.5.1.5 if applicable.
- 14. 'DRAWBARS'**
- 14.1. The 'Drawbar' must be securely attached to a substantial structural member of the trailer. The strength of the 'Drawbar' and its attachments
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must comply with either Clause 14.2 or the standard referenced in clause 15.1.11.

- 14.2. The *'Drawbar'* including the connections between the *'Drawbar'* and the trailer must withstand at least the relevant static or dynamic forces nominated in clauses 14.2.1 or 14.2.2 when these forces are applied separately at the intended *'Coupling'* centreline without incurring any residual deformation that would interfere or degrade the function of the assembly or any breaks, cracks and separation of components. The static forces must be maintained for not less than 10 seconds. Alternatively approval can be by *'Approved'* calculations as per clause 14.2.3.

14.2.1. **'Drawbars'– Static Testing**

14.2.1.1. **Longitudinal Tension and Compression**

- 14.2.1.1.1. For trailers up to 23.5 tonnes *'ATM'* other than *'Converter Dollies'*, (N) $1.5 \times 9.81 \times \text{'ATM'}$ (kg).
- 14.2.1.1.2. For trailers over 23.5 tonnes *'ATM'* and all *'Converter Dollies'*, the greater of 350 kN or $2.25 \times \text{'Coupling' 'D-value'}$ (kN) for the *'Coupling' 'D-value'* at which the *'Drawbar'* is rated.

14.2.1.2. **Transverse Thrust**

- 14.2.1.2.1. For trailers up to 4.5 tonnes *'ATM'*, (N) $0.5 \times 9.81 \times \text{'ATM'}$ (kg).
- 14.2.1.2.2. For trailers over 4.5 tonnes *'ATM'* without dolly locking devices, 120 kN. Alternatively, the following may be used:
- 14.2.1.2.2.1. *'Single Axle'* trailer or a *'Dog Trailer'* with a *'Single Axle'* front *'Axle Group'*, (N) $11 \times M/(\text{DL})$.
- 14.2.1.2.2.2. *'Tandem Axle Group'* trailer or a *'Dog Trailer'* with a *'Tandem Axle Group'* front *'Axle Group'*, (N) $18 \times M/(\text{DL}-1)$.
- 14.2.1.2.2.3. *'Triaxle Group'* trailer or a *'Dog Trailer'* with a *'Triaxle Group'* front *'Axle Group'*, (N) $24 \times M/(\text{DL}-1.6)$

where: M is the *'GGALR'* (kg) for the front *'Axle Group'* of *'Dog Trailers'* or the *'GTM'* (kg) for other trailers.

DL is the *'Drawbar Length'* (m)

- 14.2.1.2.3. For trailers over 4.5 tonnes *'ATM'* with dolly locking devices, (N) $0.5 \times 9.81 \times \text{'ATM'}$ (kg).

14.2.1.3. **Vertical Tension and Compression:**

- 14.2.1.3.1. For trailers up to 4.5 tonnes *'ATM'*, (N) $0.5 \times 9.81 \times \text{'ATM'}$ (kg).
- 14.2.1.3.2. For trailers over 4.5 tonnes *'ATM'*, 120 kN. Alternatively, the following may be used:
- 14.2.1.3.2.1. Rigid *'Drawbar'* trailers, (kN) $2.25 \times \text{'V-value'}$ (kN), where the *'V-value'* is as calculated in AS 2213.1:2001 using the equations in clause 7 of the standard with *'a'* = 2.4.
- 14.2.1.3.2.2. Hinged *'Drawbar'* trailers, +/- 10 kN.

14.2.2. 'Drawbars' – Dynamic Testing

14.2.2.1. For 'Drawbars' for 'Pig Trailers' up to 3.5 tonnes 'ATM' and hinged 'Drawbars' for other trailers, a horizontal oscillating force of (kN) $\pm 0.6 \times$ 'Coupling' 'D-value' (kN) in the longitudinal direction concurrently for at least 2 million cycles. The frequency must not exceed 35 Hz and must be chosen so as not to coincide with any natural frequencies of the system:

14.2.2.2. For rigid 'Drawbars' for 'Pig Trailers' over 3.5 tonnes 'ATM', a horizontal alternating force of (kN) $\pm 0.6 \times$ 'Coupling' 'D-value' (kN) acting in the longitudinal axis of the 'Coupling' and a vertical alternating force of (kN) static vertical 'Coupling' load $\pm (0.6 \times$ 'Coupling' 'V-value' (kN)) in the vertical axis of the 'Coupling' asynchronously for at least 2 million cycles.

The static vertical 'Coupling' load (kN) = $9.81 \times S$

where: $S =$ 'ATM' - 'GTM' (tonnes).

The frequency of the longitudinal and vertical forces must differ by between 1% and 3% and are not to exceed 35 Hz, but must be chosen so as not to coincide with any natural frequency of the system.

14.2.3. 'Drawbars' – 'Approved' Calculations

The strength of a 'Drawbar' may be demonstrated for loads as per clauses 14.2.1 or 14.2.2 by 'Approved' calculation procedures where the calculations take in to account both strength and fatigue resistance.

14.3. 'Drawbars' – Safety Chains

14.3.1. Safety chains must be affixed to a substantial structural member on every trailer that is not fitted with an 'Emergency Brake System' in accordance with ADR 38/... Trailer Brake Systems and on every 'Drawbar' of a rigid 'Drawbar' trailer except a 'Converter Dolly'.

14.3.1.1. For trailers over 2.5 tonnes 'ATM', there must be two safety chains fitted for connection to the towing vehicle. Each safety chain must meet separately the strength requirements of clause 14.3.1.2 or 14.3.1.3.

14.3.1.2. For trailers up to 3.5 tonnes 'ATM', the safety chain must comply with AS 4177.4 - 2004 Safety chains up to 3500 kg capacity; or

14.3.1.2.1. be a safety cable with a certified load capacity not less than that of a chain complying with AS 4177.4 - 2004.

14.3.1.3. For trailers over 3.5 tonnes 'ATM', the safety chain must be made from steel of a minimum 800 MPa breaking stress, conform to the mechanical properties of Grade T chain as specified in AS 2321 - 2001 Short Link Chain for Lifting Purposes and must be of a size such that the minimum breaking load exceeds the 'ATM'.

14.4. 'Drawbars' – Safety Chain Attachment Points

14.4.1. Any safety chain attachment point affixing a safety chain to a 'Drawbar' must be located as near as practicable to the 'Coupling'. Where two points of attachment are required they must be mounted one on either side of the centreline of the 'Drawbar'.

- 14.4.2. Any safety chain attachment point affixing a safety chain to a *'Drawbar'* must withstand at least the following forces, separately applied, without incurring either any residual deformation that would interfere or degrade the function of the assembly or any breaks, cracks or separation of the components. The static forces must be maintained for not less than 10 seconds:
- 14.4.2.1. Longitudinal tension in accordance with clause 14.2.1.1; and
- 14.4.2.2. vertical tension in accordance with clause 14.2.1.3;

15. ALTERNATIVE STANDARDS

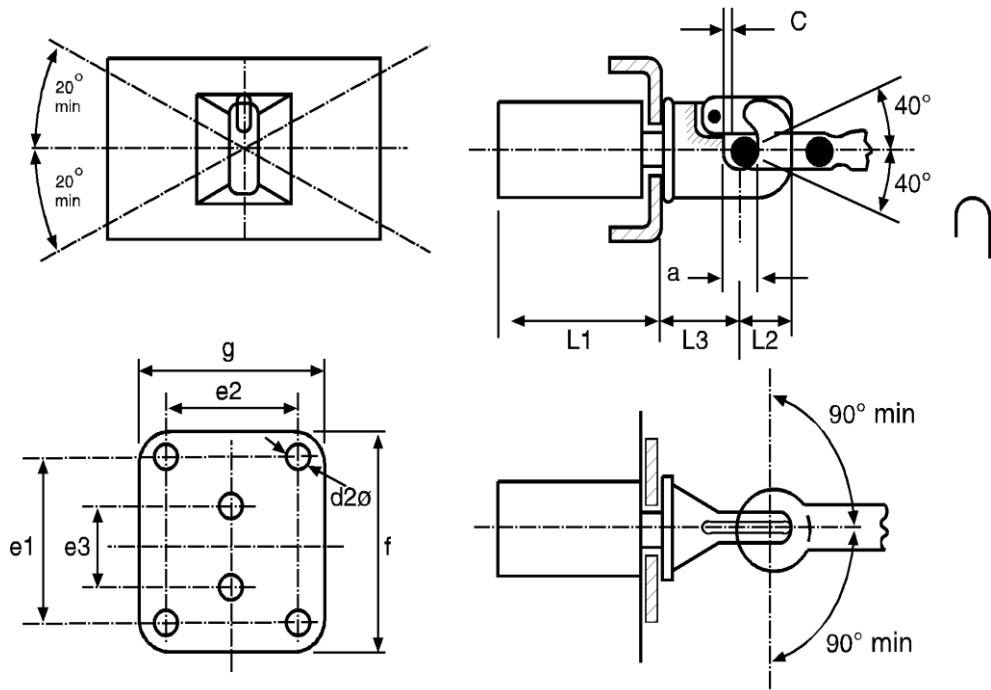
- 15.1. The technical requirements of ECE Regulation No. 55/01 Uniform Provisions Concerning the Approval of Mechanical Coupling Components of Combinations of Vehicles shall be deemed to be equivalent to the technical requirements of this standard as applicable to:
- 15.1.1. Class G50 standard 50 mm pin diameter fifth wheel couplings and class H fifth wheel coupling pins, 50 mm diameter;
- 15.1.2. Class G50-X non-standard 50 mm pin diameter fifth wheel couplings if the manufacturer can demonstrate that they can be reliably coupled to class H fifth wheel coupling pins, 50 mm diameter;
- 15.1.3. Class H50-X non-standard 50 mm pin diameter fifth wheel coupling pins if the manufacturer can demonstrate that they can be reliably coupled to class G50 standard 50 mm pin diameter fifth wheel couplings;
- 15.1.4. Class C drawbar couplings with a 50 mm diameter pin and class D drawbar eyes having a parallel hole suitable for a 50 mm diameter pin;
- 15.1.5. Class A50-1 to A 50-5 standard 50 mm coupling balls with flange type bolted fixing;
- 15.1.6. Class A50-X non-standard 50 mm coupling balls and brackets if the manufacturer can demonstrate that they can be reliably coupled to class B coupling heads fitted to the drawbar of trailers for connecting to the 50 mm diameter coupling ball;
- 15.1.7. Class B coupling heads fitted to the drawbar of trailers for connecting to the 50 mm diameter coupling ball, but excluding class B50-X, non-standard 50 mm diameter coupling heads;
- 15.1.8. Class B50-X non-standard 50 mm diameter coupling heads if the manufacturer can demonstrate that they can be reliably coupled to class A coupling balls and towing brackets employing a 50 mm diameter spherical device;
- 15.1.9. Classes KA1, KA2 or KA3 hook type couplings;
- 15.1.10. Classes L1, L2, L3, L4 or L5 toroidal drawbar eyes;
- 15.1.11. Class E drawbars, but excluding their installation.
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APPENDIX 1

Dimensional Requirements for 'Hook Couplings'

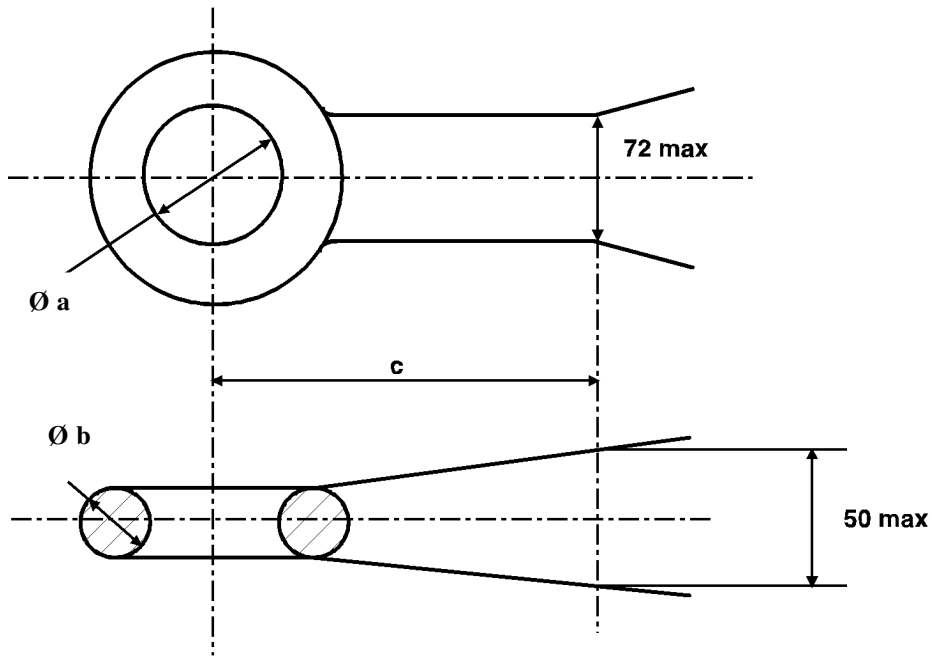
Refer Clause 11.6

The following has been reproduced from ECE Regulation No. 55/01 Uniform Provisions Concerning the Approval of Mechanical Coupling Components of Combinations of Vehicles, incorporating Corrigendum 1 to Revision 1 of the regulation.



Class	K1	K2	K3	K4	KA1	KA2	KA3	Remarks
e1	-	83	83	120	120	140	160	+ 0.5
e2	-	56	56	55	55	80	100	+ 0.5
e3	90	-	-	-	-	-	-	+ 0.5
d2	17	10.5	10.5	15	15	17	21	H13
c	3	3	3	3	3	3	3	Min.
f	130	175	175	180	180	200	200	Max.
g	100	100	100	120	120	140	200	Max.
a	45	45	45	45	45	45	45	+ 1.6/- 0.0
L1	120	120	120	120	250	300	300	Max.
L2	74	74	63	74	90	90	90	Max.
L3	110	130	130	150	150	200	200	Max.

Figure 1. Dimensions for Class K hook type couplings (mm)



Class	L1	L2	L3	L4	L5	Remarks
a	68 +1.6/-0.0	76.2 ±0.8	76.2 ±0.8	76.2 ±0.8	68 +1.6/-0.0	
b	41.2 ±0.8	41.2 ±0.8	41.2 ±0.8	41.2 ±0.8	41.2 ±0.8	
c	70	65	65	65	70	Min

Figure 2. Dimensions of Class L toroidal drawbar eyes (mm)