Vehicle Standard (Australian Design Rule 3/02 – Seats and Seat Anchorages) 2005

Compilation:	1 (up to and including Vehicle Standard (Australian Design Rule 3/02 – Seats and Seat Anchorages) 2005 Amendment 1)
Compilation Date:	7 February 2007
Compiled by:	Vehicle Safety Standards, Department of Transport and Regional Services.

CONTENTS

1. LEGISLATIVE PROVISIONS

1.1. NAME OF STANDARD

1.1.1. This Standard is the Vehicle Standard (Australian Design Rule 3/02 – Seats and Seat Anchorages) 2005.

1.1.2. This Standard may also be cited as Australian Design Rule 3/02 — Seats and Seat Anchorages.

1.2. COMMENCEMENT

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

1.3. REPEAL

1.3.1. This Standard repeals each vehicle standard with the name Australian Design Rule 3/02 — Seats and Seat Anchorages that is:

(a) made under section 7 of the Motor Vehicles Standard Act 1989; and

(b) in force at the commencement of this Standard.

1.3.2. This Standard also repeals each instrument made under section 7 of the Motor Vehicles Standard Act 1989 that creates a vehicle standard with the name Australian Design Rule 3/02 — Seats and Seat Anchorages, if there are no other vehicle standards created by that instrument, or amendments to vehicle standards made by that instrument, that are still in force at the commencement of this Standard.

2. SCOPE

The function of this Australian Design Rule is to specify requirements for *'Seats'*, their attachment assemblies, and their installation to minimise the possibility of occupant injury due to forces acting on the *'Seat'* as a result of vehicle impact.

3. APPLICABILITY AND IMPLIMENTATION

3.1. This ADR applies to the design and construction of vehicles as set out in the table below.

3.2. Vehicles certified to the requirements of any of the "Acceptable Prior Rules" as shown below in the Applicability Table for a particular category are deemed to comply with this Rule.

3.2.1. Vehicles certified to ADR 3/03 or a later version need not comply with this rule.

3.3. Applicability Table

Vehicle Category	ADR Category Code	UNECE Category Code	Manufactured on or After	Acceptable Prior Rules
Moped 2 wheels	LA	L1	N/A	
Moped 3 wheels	LB	L2	N/A	
Motor cycle	LC	L3	N/A	
Motor cycle and sidecar	LD	L4	N/A	
Motor tricycle	LE	L5		
	LEM		N/A	
	LEP		1 Mar 1995	Nil
	LEG		1 Mar 1995	Nil
Passenger car	MA	M1	1 Jan 1995	Nil
Forward-control passenger vehicle	MB	M1	1 Jan 1995	Nil
Off-road passenger vehicle	MC	M1	1 Jan 1995	Nil
Light omnibus	MD	M2		
up to 3.5 tonnes *'GVM'* and up to 12 seats	MD1		1 July 1995	Nil
up to 3.5 tonnes *'GVM'* and more than 12 seats	MD2		1 Jan 2000	Nil
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		
Light goods vehicle	NA	N1	1 July 1995	Nil
Medium goods vehicle	NB	N2		
over 3.5 tonnes up to 4.5 tonnes *'GVM'*	NB1		N/A	
over 4.5 tonnes up to 12 tonnes *'GVM'*	NB2		N/A	
Heavy goods vehicle	NC	N3	N/A	
Very light trailer	TA	O1	N/A	
Light trailer	TB	O2	N/A	
Medium trailer	TC	O3	N/A	
Heavy trailer	TD	O4	N/A	

4. DEFINITIONS

4.1. Refer to Vehicle Standard (Australian Design Rule Definitions and Vehicle Categories) 2005.

5. REQUIREMENTS

5.1. Side-facing 'Seats' need not comply with the requirements of this rule.

5.2. Any *'Head Restraint'* proposed to be used must be included in the *'Seat'*.

5.3. The seat-anchorage must withstand the loads specified in clause 5.5 in addition to the total load imposed by any other device attached to the seat-anchorage applied simultaneously.

5.4. The front *'Seats'* of vehicles meeting the requirements of ADR 69/... are deemed to meet the requirement of clause 6.1.2 and the forward longitudinal loading requirements of clauses 5.5.1, 5.8.3 and 5.8.4.

5.5. Each *'Seat'* must withstand the loads specified in clauses 5.5.1, 5.5.2, and 5.5.3 and also meet the requirements in clauses 5.6, 5.7, 5.8 and 5.9.

5.5.1. The following loads must be applied separately:

5.5.1.1. Twenty times the weight of the entire 'Seat' in a 'Forward' longitudinal direction simultaneously with, if part or all of the 'Seatbelt Assembly' is directly attached to the 'Seat', the total load imposed on the 'Seat' by simultaneous application of loads required for seatbelt 'Anchorages' specified in ADR 5/... . The 'Seat' must be located in the full 'Forward' and upward design position.

5.5.1.1.1. When part or all of the seat belt 'Anchorages' are directly attached to the 'Seat' an additional test, with the seatbelt 'Anchorages' load applied, is required with the 'Seat' in the rearmost position to demonstrate compliance with ADR 5/... .

5.5.1.2. Where the 'Child Restraint Anchorages' are located in or on the 'Seat' back, or are located in the vehicle body structure more than 100 mm below a horizontal plane tangential to the point on the top of the 'Seat' back longitudinally 'Forward' of the 'Child Restraint Anchorage', twenty times the weight of the entire 'Seat' in a 'Forward' longitudinal direction simultaneously with a load of 3.4 kN for each 'Child Restraint Anchorage' must be imposed on the 'Seat' by simultaneous application to each 'Child Restraint Anchorage' by a flexible connection which passes over the top of the 'Seat' back to the 'Child Restraint Anchorage'. Each load must be applied 'Forward' of the 'Seat' back not more than 5^{o} above or below the horizontal, and not more than 5^{o} to left or right of the longitudinal axis of the vehicle.

5.5.2. A load equal to 20 times the weight of the entire *'Seat'* must be applied in a 'Rearward' longitudinal direction.

5.5.3. A load producing a moment of 530 N.m about the '*Seating Reference Point'* for each occupant position for which the *'Seat'* is designed must be applied to the upper cross member in a *'Rearward'* longitudinal direction, unless it is demonstrated that 'Seat' assemblies such as rear

'Seat' backs are supported by a vehicle body member capable of withstanding the nominated load.

5.5.3.1. Testing which meets the 530 N.m requirement by any one of the following 3 methods is acceptable:

5.5.3.1.1. force applied horizontally;

5.5.3.1.2. force applied normal to 'Seat' back;

5.5.3.1.3. force applied longitudinally and 'Rearward' to the upper part of the 'Seat' back frame through a component simulating the back of a 3-D manikin.

5.5.3.1.4. If deflection of the 'Seat' back causes the moment arm to change, the force should be adjusted to ensure that the moment value of 530 N.m is achieved.

5.5.3.1.5. The 'Seat' must be located in the design position determined by the 'Manufacturer' to represent the worst case in relation to the loadings induced in the seat-anchorage and 'Seat Adjuster' mechanisms by the 530 N.m moment.

5.6. The *'Seat Adjusters'* need not be operable after the application of the loads specified in clauses 5.5.1, 5.5.2 and 5.5.3.

5.7. No release of the *'Seat Adjuster'* must occur during the application of the loads specified in clauses 5.5.1, 5.5.2 and 5.5.3.

5.8. Restraining Device for Hinged *'Seats'* or *'Seat'* Backs

5.8.1. Except for a *'Seat'* having a back that is adjustable only for the comfort of its occupants, hinged *'Seats'* or *'Seat'* backs must be equipped with a self-locking device for restraining the hinged *'Seat'* or *'Seat'* back and a release control for releasing that restraining device to preclude the possibility of impact forces acting on unrestrained hinged *'Seats'* or *'Seat'* backs.

5.8.2. Where the *'Seat'* must hinge to permit access to or egress from another seating position, the release control must be readily accessible to the occupant of that *'Seat'* and to the occupant of any *'Seat'* immediately behind that *'Seat'*.

5.8.3. The restraining device (including the release control) must be constructed to preclude inertial release when loaded longitudinally in each horizontal direction to 20 times the acceleration due to gravity.

5.8.4. The restraining device must not release or fail when a *'Forward'* horizontal longitudinal load equal to 20 times the weight of the entire *'Seat'* back is applied at the centre of mass of the *'Seat'* back.

5.8.5. If non-self-locking auxiliary latches are provided they must be unlatched during testing so that only the restraining device and hinges are taking the test loads.

5.8.6. Where *'Seats'* are mounted on hinged covers, e.g. engine covers, and the *'Seat'* assembly can withstand the test loads without tilting of the hinged cover and without any latches being latched, then the latches need not be self-locking.

5.9. Energy Dissipation

The surfaces of the rear parts of *'Seats'* to be checked are:

5.9.1. All *'Contactable'* surfaces in Area 1 as defined in clause 6.5.1 and;

5.9.2. All *'Contactable'* surfaces exhibiting radii of curvature less than 5 mm in Area 2 as defined in clause 6.5.2

5.9.3. These surfaces when tested as per clause 6.4 must not produce a deceleration of the moving head greater than 80 times the acceleration due to gravity continuously for more than 3 ms.

5.9.4. The requirements of clause 5.9 do not apply to rearmost *'Seats'* or back-to-back *'Seats'* or vehicles with only a single row of *'Seats'*.

6. TEST PROCEDURE

6.1. General

6.1.1. Static or dynamic testing techniques may be used.

6.1.2. The *'Seat'* travel stops must not take any part of the test load.

6.1.3. Hinged *'Seats'*, or *'Seats'* with backs which are adjustable for passenger comfort only, must be tested with the *'Seat'* back at the design *'Seat Back Angle'*.

6.1.4. The requirements of clause 5.5.1 and clause 5.5.2 are considered to be met if the *'Seat'* is tested after being adjusted in the following two positions:

6.1.4.1. the longitudinal adjustment is fixed one notch or 10 mm rearwards of the most 'Forward' normal driving or use position (for 'Seats' with independent vertical adjustment the cushion must be placed in its highest position);

6.1.4.2. the longitudinal adjustment is fixed one notch or 10 mm forwards of the most 'Rearward' normal driving or use position (for 'Seats' with independent vertical adjustment the cushion must be placed in its lowest position).

6.2. Static Test Conditions

6.2.1. Static testing of *'Seats'* must be conducted in accordance with SAE document J879b "Motor Vehicle Seating Systems", July 1968 using the values specified in and the procedures applicable to this rule.

6.2.2. Distributed loads may be replaced by concentrated loads at the loading centroid.

6.2.3. Specified loads must be sustained for at least one second.

6.2.4. Notwithstanding the requirements of the test procedure specified in clause 6.2.1, the testing of *'Seats'* must meet the test requirements specified in clause 6.1 of this rule.

6.3. Dynamic Test Conditions

6.3.1. Dynamic testing must be conducted at the vehicle *'Manufacturer's'* choice either to clause 6.3.2 or 6.3.3.

6.3.2. Dynamic testing may be carried out in accordance with the dynamic test procedure of EEC Directive 74/408/EEC- "Strength of Seats and their Anchorages" for front-facing *'Seats'* which are not *'Folding Seats'* and which do not incorporate any built-in seatbelt *'Anchorages'*.

6.3.3. Alternatively, the following criteria must be met:

6.3.3.1. The acceleration pulse applied must be such that all the parts of the 'Seat' and supporting structure which anchors it to the vehicle have at least an acceleration of 20 times the acceleration due to gravity simultaneously in the same direction; and

6.3.3.1.1. any additional forces due to the loading of seatbelt 'Anchorages' or 'Child Restraint Anchorages' must be achieved simultaneously with the acceleration required in clause 6.3.3.1 above.

6.4. Energy Dissipation Test

6.4.1. The *'Seat'* must be firmly secured to the test bench, using the attachment parts provided by the *'Manufacturer'* and in the same manner in which it is intended to be mounted in the vehicle with the *'Seat'* back in the *'Manufacturer's'* design position.

6.4.2. The dynamic testing equipment must consist of a rigid moving head having an effective mass of 6.8 $\pm$ 0.1 kg. The portion of the moving head which contacts the *'Seat'* back must be of spherical shape with a diameter of 165 mm. The direction of impact from the rear towards the front must be situated in a vertical longitudinal plane and lie along a line at 45^{o} downwards relative to the normal level vehicle attitude.

6.4.3. The moving head must impact the *'Seat'* back at a velocity of not less than 6.69 m/s.

6.4.4. A transducer must be mounted on the moving head such that a complete deceleration time curve is obtained using an oscilloscope or other recording device. The deceleration channel must have a frequency response flat to within $\pm$ 5 per cent from one to 1000 Hz.

6.5. Contactable Areas

6.5.1. Area 1

In the case of separate *'Seats'* without *'Head Restraints'*, this area shall include the rear part of the *'Seat'* back between the longitudinal vertical planes situated at 100 mm on either side of the *'Seating Reference Plane'* and above a plane perpendicular to the *'Torso Reference Line'* 100 mm below the top of the *'Seat'* back.

In the case of bench *'Seats'* without *'Head Restraints'*, this area shall extend between the longitudinal vertical planes situated at 100 mm on either side of the *'Seating Reference Plane'* of each designated outboard seating position defined by the *'Manufacturer'* and above a plane perpendicular to the *'Torso Reference Line'* 100 mm below the top of the *'Seat'* back.

In the case of *'Seats'* or bench *'Seats'* with *'Head Restraints'*, this area shall extend between the longitudinal vertical planes situated at 70 mm

on either side of the *'Seating Reference Plane'* or of the seating position concerned and situated above the plane perpendicular to the *'Torso Reference Line'* 635 mm from the *'Seating Reference Point'*. For the test, the *'Head Restraint'*, if adjustable, shall be placed in the most unfavourable position permitted by its adjustment system.

6.5.2. Area 2

In the case of *'Seats'* or bench *'Seats'* without *'Head Restraints'* and *'Seats'* or bench *'Seats'* with detachable or separate *'Head Restraints'*, Area 2 shall extend above a plane perpendicular to the *'Torso Reference Line'* 100 mm distant from the top of the *'Seat'* back, other than parts of Area 1.

In the case of *'Seats'* or bench *'Seats'* with integrated *'Head Restraints'*, Area 2 shall extend above a plane perpendicular to the *'Torso Reference Line'* 440 mm distant from the *'Seating Reference Point'* of the *'Seat'* or the seating position concerned, other than parts of Area 1.

7. ALTERNATIVE STANDARDS

The technical requirements of ECE R 17/03 or ECE R 17/04 "Seats and their Anchorages" together with, where applicable, the technical requirements of either clause 5.5.1.1 or ECE R 14/02 "Safety Belt Anchorages" and of clause 5.5.1.2 are deemed to be equivalent to the technical requirements of this rule for front-facing *'Seats'* which are not *'Folding Seats'* .

NOTES

This compilation of Vehicle Standard (Australian Design Rule 3/02 – Seats and Seat Anchorages) 2005 includes all the instruments set out in the Table of Instruments. The Table of Amendments provides a history of clauses that have been amended, inserted or deleted.

Table of Instruments

Name of Instrument	**Registration Date**	**Commencement Date**
Vehicle Standard (Australian Design Rule 3/02 – Seats and Seat Anchorages) 2005	12/12/05	13/12/05
Vehicle Standard (Australian Design Rule 3/02 – Seats and Seat Anchorages) 2005 Amendment 1	22/01/2007	23/01/2007

Table of Amendments

Clause affected	**How affected**	**Amending instrument**
3.2.1	ad	Vehicle Standard (Australian Design Rule 3/02 – Seats and Seat Anchorages) 2005 Amendment 1

ad = added or inserted
am = amended
del = deleted or removed
rr = removed and replaced
→ = clause renumbered. This takes the format of old no. → new no.