



COMMONWEALTH OF AUSTRALIA

AUSTRALIAN DESIGN RULE 22A
FOR
HEAD RESTRAINTS

As Endorsed by the
 Australian Transport Advisory Council

The intention of this Australian Design Rule is to define standards for the construction of head restraints so as to limit the severity of injury in the event of rear-end impacts and to ensure that the head restraints cannot be adjusted too low.

The Australian Transport Advisory Council has recommended to Commonwealth, State and Territory Governments that all motor vehicles specified below shall be equipped with head restraints complying with Australian Design Rule 22A - Head Restraints.

VEHICLE CATEGORY	RULE AMENDMENT		
	MANUFACTURED ON OR AFTER		
	22A		
Passenger Cars			
Forward Control Passenger Vehicles up to 8 seats	1 Jan 1985		
9 seats	1 Jan 1986		
Other Passenger Cars	1 Jan 1975		
Passenger Car Derivatives	1 Jan 1975		
Multi-Purpose Passenger Cars	1 Jan 1975		
Omnibuses up to 3.5 tonnes GVM			
up to 12 seats	1 Jan 1987		
over 12 seats	N/A		
up to 4.5 tonnes GVM	N/A		
over 4.5 tonnes GVM	N/A		
Motorcycles	N/A		
Mopeds	N/A		
Specially Constructed Vehicles	N/A		
Other Vehicles not listed above			
up to 4.5 tonnes GVM	N/A		
over 4.5 tonnes GVM	N/A		

N/A - Not Applicable
 GROSS VEHICLE MASS - Abbreviated to 'GVM'

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AUSTRALIAN DESIGN RULE NO. 22A - HEAD RESTRAINTS

22.1 Definition

22.1.1 Head Restraint - A device either mounted on or integral with the seat back. Its function is to minimize rearward movement of the head.

22.1.2 Torso Line - A line parallel to the small of the two-dimensional manikin's back and extending through the H point (Centreline of probe in full back position on three-dimensional manikin). The two and three dimensional manikins are as specified in Society of Automotive Engineers Standard J826 - Manikins for Use in Defining Seating Accommodation, November 1962.

22.1.3 Head Reference Line - The reference line used for measuring head deflections of a dummy in dynamic testing. It is the extension of the superimposed torso line when the dummy is located with the head and the back in contact with a common flat surface.

22.2 Location and Size

22.2.1 A head restraint shall be provided for each outboard front seat position. It may be provided with vertical and lateral adjustable mounting.

22.2.2 The head restraint shall be so designed that:

- (a) it presents an impact surface which extends between two planes not less than 115 mm apart and normal to the torso line, and
- (b) the upper boundary of the impact surface is not less than 700mm above the H point, measured along the torso line, for any position of adjustment which may be provided.

22.2.3 The width of the restraint shall be not less than 250 mm for use with bench seats and not less than 170 mm for use with individual seats when measured between heights of 585 mm and 635 mm above the H point and along the torso line.

22.2.4 The head restraint shall be so constructed and contoured to decelerate horizontal movements of the head without concentrations of load on it.

22.3 Requirements

22.3.1 The head restraint shall meet the conditions of either a dynamic or static test.

22.3.2 In the dynamic test, acceleration, of up to 8 times the acceleration due to gravity of the seat supporting structure shall not produce an angular displacement of the head reference line of more than 45 degrees.

22.3.3 In the static test the rearmost point of the head form shall not be displaced to more than 102 mm perpendicularly rearward of the displaced extended torso line during the application of the load specified in Clause 22.5.3 nor shall the restraint fail before a failure of the seat back or alternatively before the loading has reached 890 N.

22.4 Dynamic Test Conditions

22.4.1 For testing compliance with Clause 22.3.2 a dummy having weight and seated height of a 95th percentile male and with an approved representation of a human articulated neck structure shall have lines marked to represent the torso line and by extension, the head reference line.

22.4.2 A dummy meeting the requirements of Clause 22.4.1 shall be placed in the seating position under test and restrained by a seat belt providing upper torso restraint.

22.4.3 A forward acceleration shall be applied to the seat supporting structure. When graphically depicted, the magnitude of the acceleration curve shall not be less than that of a half-sine wave having the amplitude of 8 times acceleration due to gravity and a duration of 80 milliseconds and not more than that of a half-sine wave having an amplitude of 9.6 times acceleration due to gravity and a duration of 96 milliseconds.

22.5 Static Test Conditions

22.5.1 For compliance with Clause 22.3.3 a test device shall be selected having back plane dimensions and torso line of the three dimensional manikin specified in Society of Automotive Engineers Standard J826 - Manikins for Use in Defining Seating Accommodation, November 1962.

22.5.2 To establish the displaced torso line, a test device shall be placed in the seating position under test and a rearward moment of 370 Nm about the H point shall be applied through the back pan.

22.5.3 After removing the back pan, using a 165 mm diameter spherical head form or a cylindrical head form having a 165 mm diameter in plan view and a 150 mm height in profile view, apply, perpendicular to the displaced extended torso line, a rearward load, at a point 635 mm along the torso line from the H point, that will produce a 370 Nm moment about the H point.

22.5.4 The load shall be gradually increased to 890 N or until the seat back fails, whichever occurs first.