

AUSTRALIAN DESIGN RULE NO. 22 - 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 and located that, together with its adjustment it presents an impact surface which extends between planes normal to the torso line and located between 23 and 27.5 inches from the H point when measured along the torso line. *

22.2.3 The width of the restraint shall be not less than 10 inches for use with bench seats and not less than 6.75 inches for use with individual seats when measured between heights of 23 inches and 25 inches 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 up to 8g of the seat supporting structure shall not produce an angular displacement of the head reference line of more than 45 degrees.

* Amended February 1972

22.3.3 In the static test the rearmost point of the head form shall not be displaced to more than 4 inches 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 200 pounds. *

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 8g and a duration of 80 milliseconds and not more than that of a half-sine wave having an amplitude of 9.6g 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 3,300 inch pounds about the H point shall be applied through the back pan.

22.5.3 After removing the back pan, using a 6.5 inch diameter spherical head form or a cylindrical head form having a 6.5 inch diameter in plan view and a 6 inch height in profile view, apply, perpendicular to the displaced extended torso line, a rearward load, at a point 25 inches along the torso line from the H point, that will produce a 3,300 inch pound moment about the H point.

22.5.4 The load shall be gradually increased to 200 pounds or until the seat back fails, whichever occurs first.

* Amend February 1972