



COMMONWEALTH OF AUSTRALIA

AUSTRALIAN DESIGN RULE 29
FOR
SIDE DOOR STRENGTH

As Endorsed by the
Australian Transport Advisory Council

The intention of this Australian Design Rule is to specify strength and stiffness requirements for side doors of passenger cars to reduce intrusion into the passenger compartment as a result of side impact.

The Australian Transport Advisory Council has recommended to Commonwealth, State and Territory Governments that all motor vehicles specified below shall comply with Australian Design Rule 29 - Side Door Strength.

VEHICLE CATEGORY	RULE AMENDMENT		
	MANUFACTURED ON OR AFTER		
	29		
Passenger Cars			
Forward Control Passenger Vehicles up to 8 seats	N/A		
9 seats	N/A		
Other Passenger Cars	1 Jan 1977		
Passenger Car Derivatives	N/A		
Multi-Purpose Passenger Cars	N/A		
Omnibuses up to 3.5 tonnes GVM			
up to 12 seats	N/A		
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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29.1 Requirements

29.1.1 The vehicle shall be so constructed that when any side door which can be used for occupant access is tested in accordance with the requirements of Clause 29.2, the crush resistances as determined by Clause 29.3 shall be not less than the following:

- (i) for initial crush resistance - 10 kN or 0.83 times the unladen weight of the vehicle, whichever is the lesser figure.
- (ii) for intermediate crush resistance - 15.5 kN or 1.3 times the unladen weight of the vehicle, whichever is the lesser figure.
- (iii) for peak crush resistance - 31 kN or 2 times the unladen weight of the vehicle, whichever is the lesser figure.

29.2 Test Procedure

29.2.1 Preparation

29.2.1.1 Seats that may affect the load upon or deflection of the side of the vehicle body shall be removed.

29.2.1.2 Side windows shall be in the closed position and doors may be in the locked position.

29.2.1.3 The body sill of the side of the vehicle body opposite to the side being tested shall be placed against a substantially rigid surface.

29.2.1.4 The vehicle body shall be fixed in position by means of attachments located at or forward of the front wheel centreline and at or rearward of the rear wheel centreline.

29.2.2 Loading Device

29.2.2.1 The loading device shall consist of a substantially rigid cylinder or semi-cylinder 305 mm \pm 5 mm in diameter, with edge radii of 12 mm \pm 1 mm.

29.2.2.2 The loading device shall be of such a length that when set up in accordance with the procedure specified in Clause 29.2.3, one end surface is at least 12 mm beyond the bottom edge of the door window opening, but not of a length that will cause contact with any structure, other than window glass and ventilation window sashes, beyond the bottom edge of the door window opening during the test.

29.2.2.3 The loading device shall be so constrained that, during the test, it does not rotate nor is it displaced from its direction of travel.

29.2.3 Test Method

29.2.3.1 The loading device described in Clause 29.2.2 shall be used to apply the test load.

29.2.3.2 The loading device shall be located so that:

- (i) its longitudinal axis is:
 - (a) parallel to the vertical longitudinal plane of the vehicle,
 - (b) in the transverse vertical plane of the vehicle which passes through the midpoint of a horizontal line which is drawn across the outer surface of the door $127 \text{ mm} \pm 2 \text{ mm}$ above the lowest point of the door when the vehicle is standing on a horizontal surface.
- (ii) an end surface is not closer to the lowest point of the door than the line described in (i), and
- (iii) the cylindrical face of the device is in contact with the outer surface of the door.

The location of the loading device is illustrated in Figure 1.

29.2.3.3 The load shall be applied to the outer surface of the door in an inboard transverse direction normal to the vehicle's longitudinal centreline.

29.2.3.4 The load shall be applied such that the travel rate of the loading device does not exceed 13mm per second until the loading device has been displaced either 460mm or, provided the peak crush resistance has been satisfied, at least 310mm. The test shall be completed within 120 seconds. *

29.2.3.5 The variation of displacement of the loading device with applied load shall be recorded during the test, either continuously or in increments of not more than 26 mm or 890N for the total crush distance.

29.3 Determination of Crush Resistance

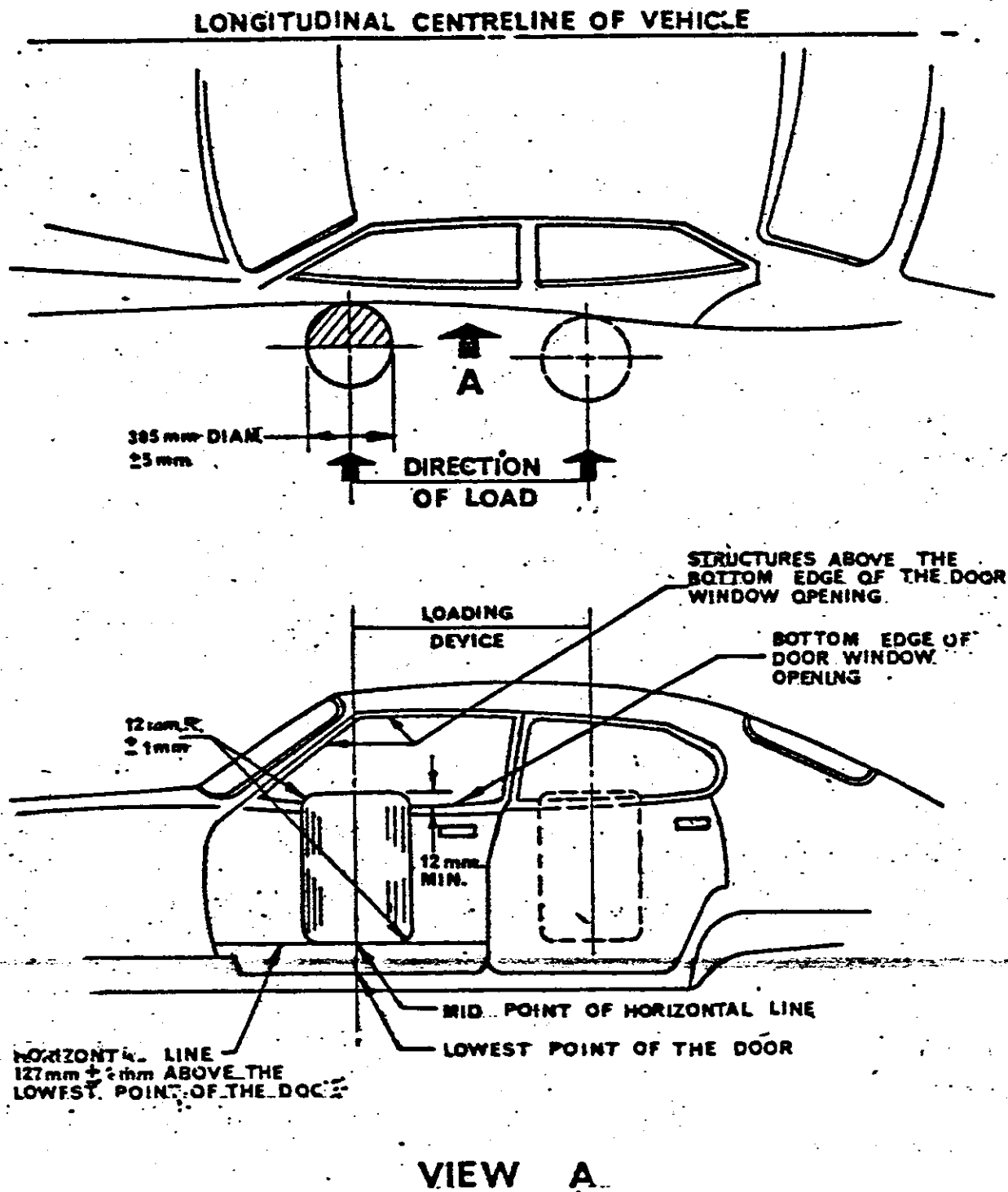
29.3.1 From the results recorded as specified in Clause 29.2.3.5, a curve of load versus displacement shall be plotted and the integral of the applied load with respect to the crush distances specified in Clause 29.3.2 and 29.3.3 obtained. These quantities divided by the specified crush distances represent the average forces required to deflect the door over these distances.

29.3.2 The initial crush resistance is the average force required to deform the door over the initial 155 mm of crush.

29.3.3 The intermediate crush resistance is the average force required to deform the door over the initial 310 mm of crush.

29.3.4 The peak crush resistance is the largest force recorded over a total crush distance not exceeding 460 mm. *

* Amended March 1976



LOADING DEVICE LOCATION AND APPLICATION TO THE DOOR

FIG.1

