

Australian Standard™

Motor vehicle frontal protection systems

Part 1: Road user protection



This Australian Standard was prepared by Committee ME-083, Motor Vehicles—Frontal Protection Systems. It was approved on behalf of the Council of Standards Australia on 16 September 2002 and published on 17 September 2002.

The following are represented on Committee ME-083:

Association of Rotational Moulders Australasia
Australian Automobile Association
Australian Automotive Aftermarket Association
Australian Industry Group
AUSTROADS
Australian Motor Vehicle Certification Board
Consumers' Federation of Australia
Ergonomics Society of Australia
Federal Chamber of Automotive Industries
Land Transport Safety Authority New Zealand
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PREFACE

This Standard was prepared by the Australian members for the Joint Standards Australia/Standards New Zealand Committee ME-083, Motor Vehicles—Frontal Protection Systems. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide manufacturers with performance requirements for vehicle frontal protection systems (VFPS) and address issues, such as the following:

- (a) Applicable Australian Design Rules requirements.
- (b) Road user protection requirements.
- (c) Test methods.
- (d) Marking and packaging.

This Standard does not address the issue of VFPS compatibility with Vehicle Occupant Protection Systems (e.g. air bag triggering).

Committee ME-083 will consider developing further Parts in the AS 4876 series. This may include a Part dealing with the protection offered to the vehicle by VFPS.

Child head impact criteria have been included incorporating values that are considered achievable.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

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STANDARDS AUSTRALIA

Australian Standard

Motor vehicle frontal protection systems

Part 1: Road user protection

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out requirements for all types of vehicle frontal protection systems (VFPS) and specifies the road user protection criterion. This Standard also requires that motor vehicles fitted with a VFPS continue to comply with the applicable Australian Design Rules (ADRs).

This Standard applies to the design and construction of vehicle frontal protection systems for motor vehicles up to and including 3500 kg GVM in the MA, MB, MC, MD1, MD2 and NA Categories, as defined in the Australian Design Rules for Motor Vehicles and Trailers.

NOTES:

- 1 The Committee recommends that this Standard, except for the road user protection criterion (refer to Clause 3.2), is applicable to VFPS for new model motor vehicles first produced after 1 January 2003.
- 2 The Committee also recommends that the performance requirement for the road user protection criterion (refer to Clause 3.2) is applicable to VFPS for new model motor vehicles first produced after 1 January 2005.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

ISO
6487 Road vehicles—Measurement techniques in impact tests—Instrumentation

ADR*
Australian Design Rules for Motor Vehicles and Trailers

1.3 DEFINITIONS

For the purpose of this Standard, the definitions given in the *Australian Design Rules for Motor Vehicles and Trailers* and those below apply.

1.3.1 Anchorage

A device designed to transfer loads from a VFPS to the vehicle. It includes bolts or screws and other hardware for the attachment of the VFPS and it may be fitted as original-vehicle equipment or supplied as part of the VFPS fitting.

1.3.2 Bumper replacement VFPS

A VFPS that is primarily designed to reduce the damage to a vehicle in the event of either a front end impact or an animal strike, in which the VFPS is fitted in place of the vehicle's front bumper (refer to Figure 1.1(a)).

* This reference refers to the latest edition of the Design Rules as amended from time to time.

1.3.3 Channel amplitude class (CAC)

A data channel designated as meeting certain amplitude characteristics specified by ISO 6487.

NOTE: The CAC number is numerically equal to the upper limit of the measurement range.

1.3.4 Channel frequency class (CFC)

A frequency class designated by a number indicating that the channel frequency response lies within limits specified by Figure 1 in ISO 6487:2000 for CFCs 1000 and 600.

NOTE: This number and the value of the frequency F_H , in hertz, are numerically equal. For the definition of characteristic frequencies F_H , F_L and F_N , refer to Figures 1 and 2 in ISO 6487:2000.

1.3.5 Head injury criterion (HIC)

The head injury criterion (HIC) is calculated from the resultant of accelerometer time histories as the maximum (depending on t_1 and t_2) of the equation:

$$HIC = (t_2 - t_1) \left[\frac{1}{(t_2 - t_1)} \int_{t_1}^{t_2} a(t) dt \right]^{2.5}$$

where a is the resultant acceleration as a multiple of gravity 'g' ($1g = 9.81 \text{ m/s}^2$) and t_1 and t_2 are the two time instants (expressed in seconds) during the impact, defining the beginning and the end of the recording for which the value of HIC is a maximum. Values of HIC for which the time interval ($t_1 - t_2$) is greater than 15 ms are ignored for the purposes of calculating the maximum value.

NOTE: The head injury criterion may also be referred to as the 'head performance criterion'.

1.3.6 Over-bumper VFPS (including nudge bar)

A VFPS that is primarily designed to reduce damage to a vehicle in the event of low speed collisions, in which the vehicle's front bumper is retained and the VFPS is mounted in front of the bumper (refer to Figure 1.1(b) and (c)).

1.3.7 Shall

Indicates that a statement is mandatory.

1.3.8 Should

Indicates a recommendation.

1.3.9 Vehicle frontal protection system (VFPS)

A structure fitted to the front of the vehicle to reduce damage to the vehicle structure and systems in the event of either a front-end impact or an animal strike (refer to Figure 1.1).

1.4 MARKING

1.4.1 General

The VFPS shall have a durable label of permanent marking (refer to Clause 1.5.2), which shall be either permanently attached or permanently marked in an area that is readily visible.

1.4.2 Information to be included on either plaque or label or permanent marking

The plaque or label or permanent marking shall display the following information in permanent, legible, upper and lower case, black characters in English not less than 4 mm high:

- (a) The name and address of the manufacturer, supplier or importer, or the manufacturer's trade mark, if made in Australia.

- (b) A description indicating the make, model, type and year(s) of manufacture of the motor vehicle for which the VFPS is designed.
- (c) An identification code that permits the manufacturer, supplier or importer to identify a specific production batch.
- (d) The statements, 'This product or its fixing must not be modified', 'No accessory or fitment shall project forward of this product's forward profile' and 'Do not use this product in any other motor vehicle for which it is not designed.'

NOTE: Manufacturers making a statement of compliance with this Australian Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

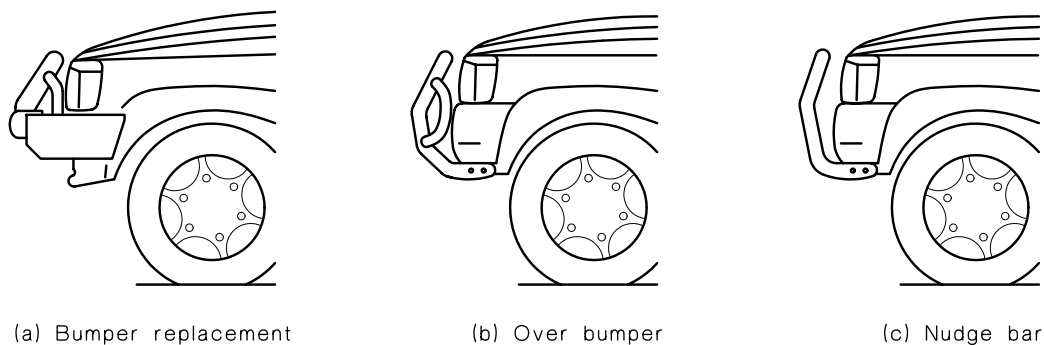


FIGURE 1.1 TYPICAL VEHICLE FRONTAL PROTECTION SYSTEMS

1.5 PACKAGING

1.5.1 General

The packaging shall include all components including threaded fasteners, if applicable, to suit the motor vehicle model for which the VFPS is intended.

The vehicle make, model and type for which the VFPS is suitable shall be clearly marked on the outside of the package, if the packaging material conceals the label on the VFPS.

Inside the packaging or attached to the vehicle frontal protection system shall be full installation instructions for the frontal protection system as specified in Clause 1.5.2.

1.5.2 Installation instructions

Each model of VFPS shall be supplied with complete instructions for the specific make, model, type and year(s) of manufacture of the vehicle for which it is intended, including the fitting of anchorages onto the motor vehicle, unless these are provided in the vehicle structure by its manufacturer. These instructions, wherever possible, should be illustrated by diagrams with a minimum of additional text. The instructions, in legible letters, shall include the following:

- (a) Do not attach VFPS to the vehicle using anchorages not intended for this purpose (e.g. engine mountings bolts).
- (b) Do not use this product for any vehicle make or model, other than those specified by the VFPS manufacturer.
- (c) Do not remove the plaque or label from the VFPS.
- (d) Do not modify the structure of the VFPS in any way.