

Sun visor for automobiles

1. Scope

This standard specifies sun visors for automobiles (hereinafter referred to as "sun visors").

Remarks 1 : In this standard, units and numerical values given in { } are based on customary units system, and are specified values.

2 : The applicable standards to this standard are as follows.

JIS D 4607	Three Dimensional Manikins for Use in Defining Automobiles Seating Accommodations
JIS D 0204	Method of High and Low Temperature Test for Automobiles Parts
JIS D 0205	General Rules of Weatherability for automobile Parts
JIS M 312-85	Testing Method of Plastics Parts for Automobiles

2. Definitions

Definitions of major terms used in this standard shall be as follows.

(1) sun visor

A flat plate part (main body) and a fixture (including clasper) provided to shield dazzling light such as direct sunshine, etc. on the driver's seat (also on the assistant seat) of an automobile for assisting safe operation.

(2) Seating reference point

A position of hip point (hip joint point) or equivalent design standard position of a manikin stipulated in JIS D 4607 when it is seated on a seat (set at the rearmost for types adjustable in longitudinal direction, at the lowest position for types adjustable in vertical direction, and at standard design angles for types of which seat back angle and seat mounting angle can be adjusted).

3. Types

The types of sun visors shall be as classified in Table 1.

Table 1 Types of sun visors

Type	Presence or absence of torque adjusting device
Vertical type	Absent
	Present
Vertical and lateral type	Absent
	Present

4. Quality

4.1 Appearance

The appearance of a sun visor shall be as follows.

- (1) The surface of a sun visor shall be free from scratches, contamination, wrinkles, unevenness, and slackness.
- (2) A sun visor shall be free from peeling and cracks that may be produced when high-frequency welder is used for working.
- (3) A fixture shall be free from scratches, burrs, and rust.

4.2 Operation

A sun visor shall be operated smoothly without producing noise.

4.3 Performance

The performance of a sun visor shall be as in Table 2.

Table 2 Performance of sun visors

Item	Performance	Applicable Paragraphs
Operating torque	About X-axis (in vertical direction) Torque equivalent to 50 m/s ² or more to 200 N·cm or less About Y-axis (in lateral direction) 40 N·cm or more to 400 N·cm or less	6.1
High temperature endurance	Shall be free from any abnormality on the items described in 4.1 and 4.2 after the high temperature test has been completed.	6.2
Light resistance	Shall be free from excessive change in appearance before and after the testing .	6.3
Operational durability	After the testing : About X-axis (in vertical direction) Torque equivalent to 50 m/s ² or more to 200 N·cm or less About Y-axis (in lateral direction) 40 N·cm or more to 400 N·cm or less	6.4
Heat history endurance	Shall be free from any abnormality on the items described in 4.1 and 4.2 after the heat history endurance test has been completed.	6.5
Impact test	A deceleration developed on the head form shall not exceed 784m/s ² {80G} successively for 3 ms or more. Any sharp hurtful end of damaged part, which may be produced during the testing , shall not come in contact with the head form.	6.6

Remarks 1. The operational torque shall be determined in this range between parties concerned.

2. Torque T (N·cm) equivalent to 50 m/s² shall be obtained by the following equation.

$$T = 5 \cdot W \cdot B$$

Where W : Load of main body (excluding shaft) (N)

B : Distance between rotational centre and centre of gravity of main body (cm)

5. Construction and shape

5.1 Construction

The construction of a sun visor shall be as follows.

(1) A sun visor shall be in such a construction that can be stored when it is not necessary to shield dazzling light such as direct sunshine, etc. and not used so that the maximum visibility can be obtained.

(2) The main body of a sun visor shall be made of a shock-absorbing material such as urethane foam, etc. or covered with a soft material.

If required, the material can be certified by the impact test stipulated in 6.6 of this standard.

(3) The top of a fixture of rigid material which is made in contact statically with the spherical head form of 165 mm in diameter shall be 3.2 mm or more in radius with a sun visor installed on a vehicle.

Also the section of below 3.2 mm in thickness shall be chamfered at a radius of 15% or more of the plate thickness.

(4) A fixture for which corrosive resistant material is not used shall be surface-treated by plating, painting, etc. or be coated with rust-inhibitor.

5.2 Shape

A sun visor shall have a size and shape enough, when used, to shield dazzling light such as direct sunshine, etc. and also hold safety visibility during the operation of a vehicle.

6. Testing method

6.1 Operation torque measurement

The operation torque of a sun visor about X-axis (in vertical direction), and Y-axis (in lateral direction) shall be measured as in the following manner.

(1) About X-axis

Install a sun visor in an exclusive jig and, with a force gauge pressing the sun visor at right angles at the center of farther side from the axis, read the gauge. Then calculate the operation torque

T_x (N·cm) by the following equation.

$$T_x = W_x \cdot L_1$$

Where W_x : Reading on gauge (N)

L_1 : Distance from X-axis (cm)

(2) About Y-axis

Install a sun visor in an exclusive jig and, with a force gauge pressing the sun visor at right angles at its tip (see Fig. 2), read the gauge. Then calculate the operation torque T_y (N·cm) by the following equation.

$$T_y = W_y \cdot L_2$$

Where W_y : Reading on gauge (N)

L_2 : Distance from Y-axis (cm)

(2) About Y-axis (In lateral direction)

Install a sun visor in an exclusive jig, and rotate it by 90° about Y-axis at a cycle as shown in Table 3 (See Fig. 4). After the operation of 200 cycles has been completed, immediately measure a torque in accordance with 6.1 (2).

6.5 Heat history endurance test

A test in which one cycle is composed of tests for 15.5 hours at 80° C, for 0.5 hour at room temperature, for 7.5 hours at -30° C, and for 0.5 hour at room temperature in that order shall be made by two cycles or more in accordance with JASO M 312, 5.1.4 [(4) Cold Repeat Test], and the results shall be compared with those before testing, to investigate a change between them.

6.6 Impact test

6.6.1 Head impact area

A head impact area shall be defined as follows.

- (1) Among the whole surface of a cabin excluding window glass surface, a surface which is made in contact statically with a head form or in contact with it when the form is drawn in the same conditions at all use positions of the sun visor, when a device with a spherical head form (hereinafter referred to as "head form device") of 165 mm in diameter, in which a distance between the centre of rotation and the head top can be adjusted freely from 737 mm to 838 mm, is used.

Fig.3 Operational endurance test method (about X-axis)

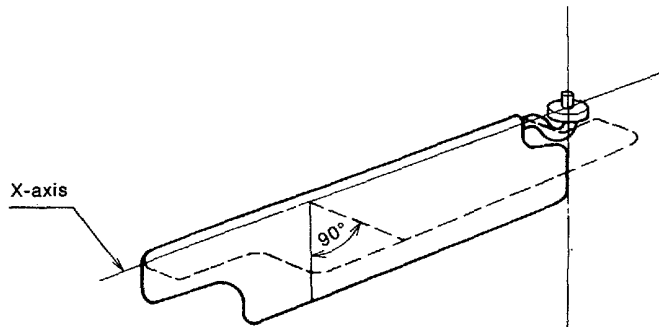
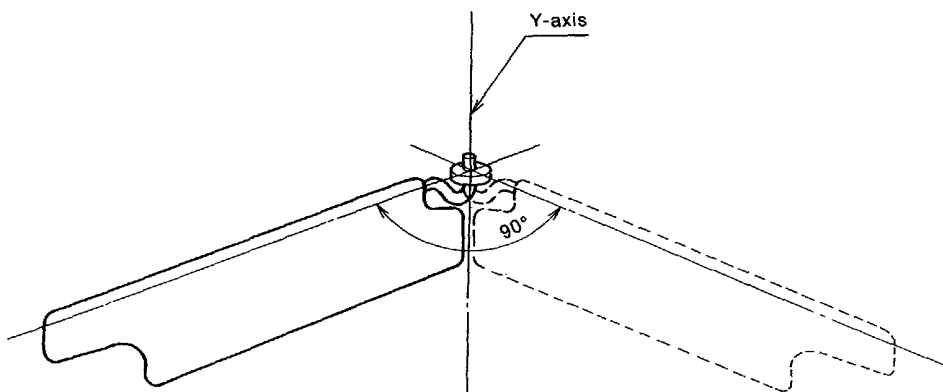


Fig. 4 Operational endurance test method (about Y-Axis)



Where, the center of rotation shall be defined as follows.

- (1.1) For seats adjustable in longitudinal direction, the centre of rotation is the seating reference point and also a point which is 127 mm (if the amount of adjustment is 127 mm or below, the maximum is applicable.) ahead of the seating reference point and moved up in vertical direction by 19 mm or the distance equivalent to seat rise due to sliding slope of seat (See Fig. 5).
- (1.2) For seats not adjustable in longitudinal direction, it is the seating reference point.
- (2) All contact points ahead of the seating reference point shall be determined for each dimension from the centre of rotation to the head, which it is capable of measuring with a measurer within the range of cabin dimensions of an automobile.
- (3) The probable contact points shall be determined by positioning a head form device upright and rotating it forward and downward so that the head passes through all arcs on the vertical planes up to 90° on both sides of the longitudinal and vertical plane of a vehicle which passes through the seating reference point.
The length of arm of the head form device for determining the contact points shall not be altered in any cycle, and each cycle

shall be started from the vertical position (See Fig. 6).

6.6.2 Mounting method of test piece

A sun visor shall be fixed to a supporter in the same manner as in fixing to actual vehicle or more firmly than that. The parts which do not affect the test may be excluded.

6.6.3 Impact position

The impact position of a sun visor shall be selected from within the head impact area.

6.6.4 Impact direction

The impact direction shall be either of the following.

- (1) Draw a horizontal line H-H which passes through the seating reference point of the outside seat in parallel with the driver's seat and is at right angles to the centre line of the vehicle.
The impact direction shall be a locus direction in which a measurer is swung down from the vertical position to the impact position obtained in 6.6.3 at right angles to the H-H line (See Fig. 7).
- (2) A direction which is vertical to the tangential plane at the impact position.

6.6.5 Testing method

The testing method is such that a head form (spherical or semi-spherical rigid form of 165 mm in diameter with an effective mass of 6.8 kg) shall be collided with a sun visor at the

Fig. 5 Rotational centre of head form device

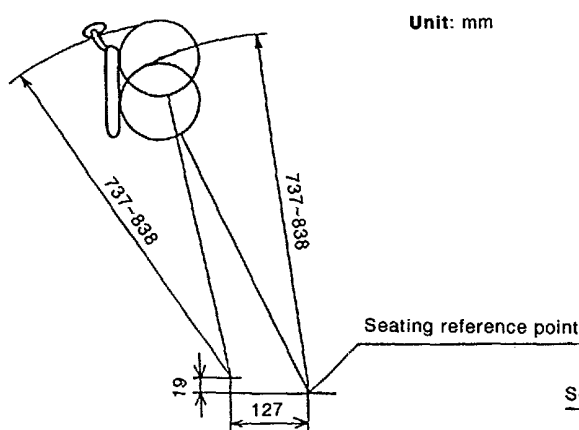


Fig. 6 Rotational method for head form device

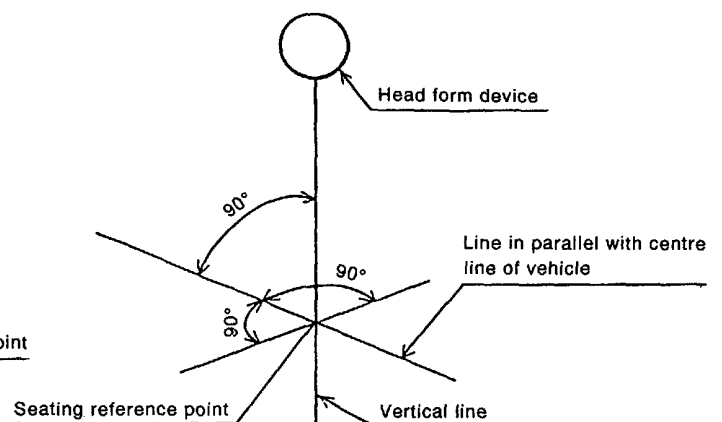


Fig. 7 Impact direction

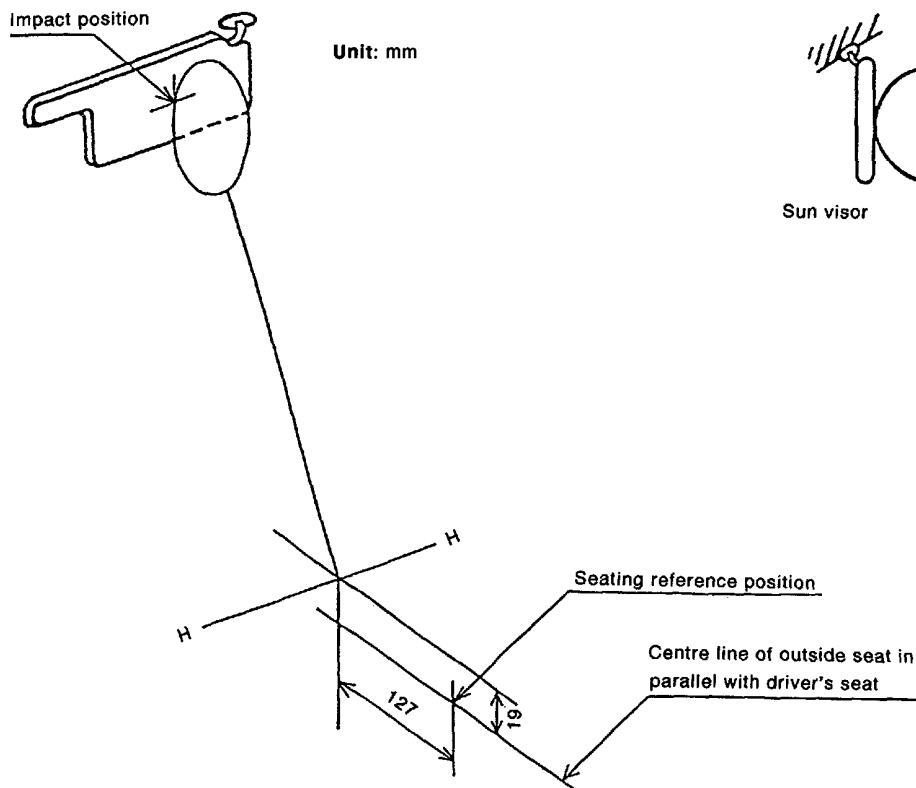
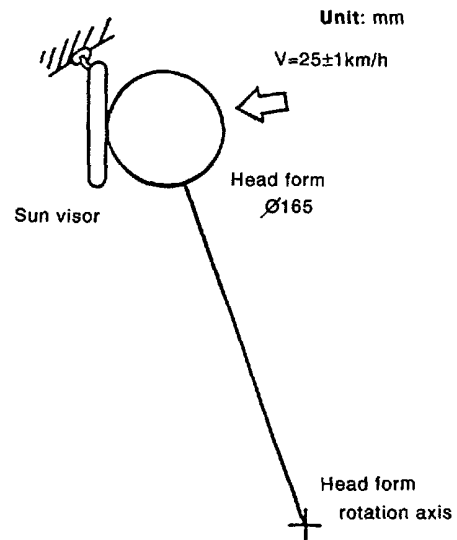


Fig. 8 Testing method



impact position in 6.6.3, in the impact direction in 6.6.4 and at a speed of 25 ± 1 km/h, and a deceleration produced on the head form shall be measured (See Fig. 8).

7. Inspection

The inspection of a sun visor shall be made for the items described in 4.1, 4.2, and 4.3, and shall meet the requirements, respectively.

Reference Standards :

ADR No.11	AUSTRALIAN DESIGN RULE 11/100 INTERNAL SUN VISORS
ECE No. 21	UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO THEIR INTERIOR FITTING
FMVSS No. 201	Occupant Protection in Interior Impact
FMVSS No. 302	Flammability of Interior Materials Technical Standard for Sunvisor Impact Absorption

Explanatory note on JASO B 404-93 Sun visor for automobiles

This explanatory note simply explains the items stipulated in the text of the standard and the related items, and not a part of the standard.

Purpose

This standard aims to increase the safety and maintain the quality of sun visors properly by standardizing the performance and testing method of them.

Item numbers in the following are the same as those in the text.

2. Definitions

A sun visor shall have a such construction that can be operated easily by hand during the operation of a vehicle, and a fixed type such as a sun visor fitted on the outside of a vehicle and colored glasses shall not be included.

4. Quality

4.3 Performance

- (a) The operational torque about X-axis shown in Table 2 of the text shall be a torque equivalent to 50 m/s² in min. reference value and of 200 N·cm in max. reference value considering the actual circumstances of each company, because the sun visor was not lowered at an operating torque equivalent to 50 m/s² when a vehicle provided with a sun visor traveled on rough terrain.
- (b) The operating torque about Y-axis in Table 2 is closely related to X-axis, and should preferably be 20 to 30 N·cm larger than that about X-axis judging from the test results of each company. The value of 40 N·cm is determined as the min. value where swinging will not occur.
- (c) The location of centre of gravity B shall be calculated by the following equation, assuming load W_1 at the shaft hole cen-

tre O of the main body and load W_2 at the tip P opposite the point O in breadth with a sun visor set horizontal.

$$B = \frac{W_2 \cdot L_1}{W_1 + W_2} = \frac{W_2 \cdot L_1}{W}$$

Where W : Load of main body
(excluding shaft) (N)

W_1 : Load at the point O
(in horizontal state) (N)

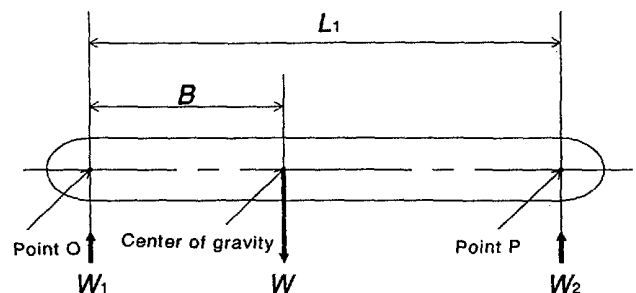
W_2 : Load at the point P
(in horizontal state) (N)

L_1 : Distance between point O
and point P (cm)

T may be calculated by using $T = 5 \cdot W_2 \cdot L_1$, applying load W_2 at the point P and a distance L_1 from the point O, instead of using $T = 5 \cdot W \cdot B$

(See the Explanatory fig. 1).

Explanatory fig.1 Calculation method of T



$$T = 5 \cdot W \cdot B = 5 \cdot W \cdot \frac{W_2 \cdot L_1}{W}$$

$$= 5 \cdot W_2 \cdot L_1$$

Fig. 1 Operation torque measuring method (about X-axis)

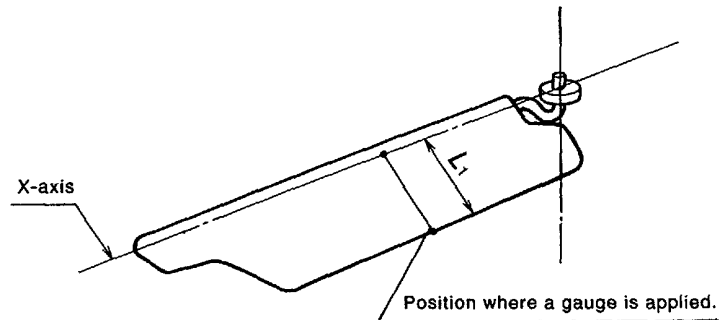
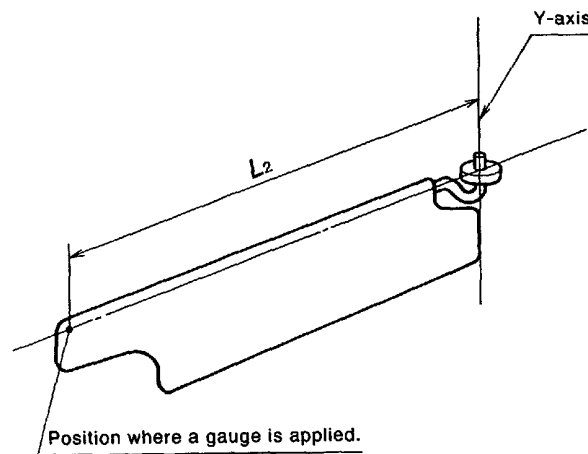


Fig. 2 Operation torque measuring method (about Y-axis)

**6.2 High temperature endurance test**

A high temperature endurance test shall be made at 100° C and for four hours in accordance with **JIS D 0204**, and the results shall be compared with those before testing, at room temperature to investigate a change between them.

6.3 Light-resistance test

A light-resistance test for test piece (1) samples from the main body of a sun visor shall be made for 150 hours by ultraviolet carbon or 75 hours by sunshine in accordance with **JIS D 0205, 5.5** (Accelerated Light-Resistance Test Method), and the results shall be compared with those before testing to investigate a change between them.

NOTE (1): The test piece shall include not only the skin of the sun visor but also packing material.

6.4 Operational endurance test

The operational endurance test shall be made as in the following manner.

(1) About X-axis (in vertical direction)

Install a sun visor in an exclusive jig, and rotate it by 90° about X-axis at a cycle as shown in **Table 3** (See **Fig. 3**). After the operation of 1000 cycles has been completed, immediately measure a torque in accordance with **6.1(1)**.

Table 3 Operation cycle

One cycle	Operational sequence	Operation (go)	Rest	Operation (back)	Rest
	Time (s)	1	1.5	1	1.5

5. Construction and shape

- (a) The purpose of a sun visor is to shield dazzling light such as direct sunshine, etc., but it is necessary to properly determine the shape and size of sun visor because the driving visibility may be obstructed by shielding and it is dangerous to drive. Since it is difficult at present situation to specify the size, dimensions, etc., the extent of safe visibility was studied to clearly specify. For specifying the extent of safe visibility clearly, however, the seat position, eye range, etc. should be specified and it means a matter which is deviated from the standard of sun visor as parts. Therefore the abstract expression is adopted in the text. Based on the driving visibility of each company, the bottom of a sun visor should be preferably positioned within a range between horizontal and 5° to the eye point as shown in the **Explanatory fig. 2**. The position of the eye point shall be in accordance with **JASO Z 008-73** and **Z 011-78**.
- (b) The main body of a sun visor is specified as described in the text 5.1 (2) considering **FMVSS No. 201** for securing the safety. For large-sized buses and trucks, the provision of 5.1 (2) may be excluded when the location of the sun visor is taken into consideration. in this case, a soft material means plastic materials and the equivalent which are

generally called the soft or semi-soft materials.

- (c) For a sun visor in which a mirror is incorporated, it is preferable to have such a construction that any broken piece is not dispersed even if the mirror is damaged.

6. Testing method

6.3 Light-resistance test

The light- resistance test is specified such that ultraviolet carbon is irradiated for 150 hours or sunshine is irradiated for 75 hours in accordance with **JIS D 0205, 5.5** (Accelerated Light- resistance test method) from the point of view that the sun visor receives relatively large amount of sunshine.

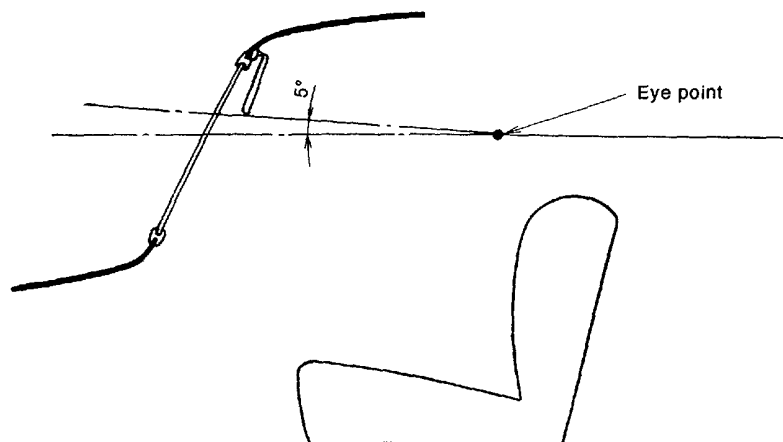
6.4 Operational endurance test

- (a) The test methods of each company for operational endurance test were almost different from each other. Then they were studied for standardization and to obtain a specific method nearest the actual use conditions. As a result, a method in which rest time is included is adopted as a standard.

6.6 Impact test

Though impact test is stipulated in ECE No. 21, ADR No. 11, FMVSS No. 201, and Japanese technical standard, ECE No. 21 and Japanese technical standard are taken into consideration to specify this standard.

Explanatory Fig. 2 Relation between sun visor and eye point positions



In the event of any doubt, the original standards in Japanese should be referred.

 : SECOND PHASED STANDARD

(The standard where customary units and converted values are given in brackets after specified values of SI units.)

Established by the Standard Council of JSAE

Date of Establishment : 1971-06-10

Date of Revision : 1983-03-17

Date of Revision : 1993-03-26

Sub Committee in which the draft was made : SC of Frontal impact

Technical Committee under which the draft was discussed : TC of Body

Investigating Committee : Standard Committee under the Standard Council

Published by

The Society of Automotive Engineers of Japan, Inc.
10-2, Goban-cho, Chiyoda-ku, Tokyo 102, Japan

This printed matter has been prepared with financial support from the Japan Auto-Race Organization.