Attachment 84

TECHNICAL STANDARD FOR WINDSHIELD WIPING AND WASHING SYSTEMS FOR PASSENGER MOTOR VEHICLES, ETC.

1. Scope

This Technical Standard shall apply to the windshield wiping and washing systems of ordinary-sized vehicles used exclusively for carriage of passengers or a small-sized motor vehicles or mini-sized motor vehicles (except motor vehicles with a riding capacity of 11 persons or more, motor vehicles used for carriage of goods with a gross vehicle weight of more than 2.8 tons, motor vehicles which are used for carriage of goods and provided with a bulkhead between the driver's compartment and the passenger and freight accommodating compartments, thereby making it impossible for passengers to move across these compartments, motor vehicles used for carriage of goods with a riding capacity of three persons or less, motor cycles with or without sidecars, mini-sized motor vehicles with caterpillar tracks and sleds, motor vehicles with a maximum speed of less than 20 km/h, and trailers).

2. Definitions

2–1 "Cycle" means the forward and return movement of the windshield wiper.

2–2 "Zone A" and "Zone B" mean the respective areas that are determined in accordance with the Annex "Determining Procedure for Zones A and B" or the respective areas that are determined by means of plotting under conditions equivalent to the procedure above.

2–3 "Blade" means a part of the wiper that makes contact with the outside face of the glazed surface and wipes it.

2–4 "Arm" means a part of the wiper that holds the blade.

2–5 "Maximum speed" means the maximum speed posted in the Specification Table of the test vehicle, expressed in units of km/h.

2–6 "Having the injection capability" means that the windshield washing system concerned is capable of delivering a greater portion of the washing fluid to the section which is wiped by the windshield wiping system without leakage of the washing fluid from the hose when the washing system concerned is actuated by applying the test voltage or the pump operating force specified in

the right column of the Table 1 in accordance with the pump type of the washing system prescribed in the left column of the same table.

Table 1 Test voltage or pump operating force

Pump type	Test voltage or pump operating force
Electric type (12 V system)	12 ~ 14 V
Electric type (24 V system)	24 ~ 28 V
Hand-operated type	110 ~ 135 N
Foot-operated type	400 ~ 445 N

2–7 “Haying the plugging-withstanding characteristic” means that the windshield washing system concerned exhibits no detrimental defects, such as disconnected hoses, breakage or motor seizure, when the washing system is actuated at a rate of six frequencies in one minute (for at least 3 seconds each frequency), with all nozzles of the washing system plugged, by applying the test voltage or the pump operating force specified in the right column of the Table 1 in accordance with the pump type of the washing system pump prescribed in the left column of the same table.

2–8 “Washing fluid for low-temperature use” means a water solution, such as methyl alcohol, isopropyl alcohol or ethylene glycol.

2–9 “Manikin” means a manikin corresponding to a fiftieth percentile adult male which is provided for in JIS D 4607–1977 (Three Dimensional Manikins for Use in Defining Automobile Seating Accommodations) or ISO 6549–1980 (Road Vehicles Procedure for H-point Determination).

2–10 “R-point” means the hip point (pivotal axis of thigh) of a manikin or the equivalent design standard position set up on the seat when the manikin is seated in accordance with the seating procedure prescribed in JIS D 4607–1977 or ISO 6549–1980. In this case, the seats shall be adjusted to the following respective positions: in the case of a seat adjustable in a fore-and-aft direction, the rearmost position in design; in the case of a seat adjustable in an up-and-down direction, the lowest position; in the case of a seat, the angle of whose reclining section is adjustable, the design standard angle or the angular position at which the torso line (referring to a line representing the inclination of the torso) becomes as close to 25 degrees back from the vertical line as possible; and in the case of a seat having other adjusting mechanisms, the design standard position.

2–11 “Eyepoints” mean the two points which are located on a straight line which passes through a point 635 mm vertically above the R-point (hereinafter referred to as the “centre of eyepoints”) and is perpendicular to the central

plane of the motor vehicle. Furthermore, these two points, spaced 65 mm from each other, are located symmetrically in relation to the centre of the eyepoints.

2–12 "Fuel cell system" means a power generation system comprised of a fuel cell stack and an air supply system.

2–13 "Fuel cell stack" means a device which generates electricity directly by causing hydrogen to react chemically with oxygen.

3. Test Procedure

3–1 Windshield wiping system

3–1–1 General test conditions

(1) The temperature of the test site shall be a normal temperature (between 5°C and 40°C), unless otherwise specified.

(2) There shall be no specific rules for order in which the tests are to be carried out, except for the test of Paragraph 3–1–3, which shall be carried out last.

3–1–2 Sweep frequency test

The test shall be conducted, following the procedure given below:

(1) Prior to the test, the outside face of the windshield of the test vehicle shall be cleaned so that no grease or foreign matter, etc. may remain on the glass surface.

(2) Operate a water sprinkling system, until the test is completed, so that the entire outside face of the windshield is kept wet.

(3) Start the engine (the fuel cell system in the case of fuel cell vehicles. Hereinafter referred to as the "power generation system") of the test vehicle. The surrounding area of the engine of the test vehicle may be cooled by a cooling fan during the test. In this case, if the wiping system of the test vehicle is an electric type, the following conditions given below (except Item ① in the case of fuel cell vehicles) shall be satisfied:

① The engine shall be in an unloaded state during the test. The revolution speed of the engine shall not exceed the speed calculated to be the speed at which the engine delivers its maximum power output (hereinafter the maximum output revolution speed)

multiplied by 0.3. In this case, if the test vehicle is equipped with an engine tachometer, the said tachometer may be used to measure the revolution speed of the engine.

② The headlamps of the test vehicle shall be turned ON and dipped;

③ The controls of the air-conditioning devices (heating device, ventilating device and defroster, etc.) of the test vehicle shall be set to an operating position where maximum air flow is obtained.
The devices shall be operated.

④ If a defroster for the windshield glass, other than the air conditioning, is provided on the test vehicle, the device concerned shall be operated in such a way that its power consumption may become the maximum.

(4) As a preliminary operation, operate the wiping system for at least 20 minutes at the lowest sweep frequency or speed (except the intermittent operation, hereinafter the same).

Then, set the wiping system to operate at the highest sweep frequency or speed. Measure the maximum sweep frequency per minute. (Here, one cycle is regarded as “one frequency.” Hereinafter the same.)

(5) Next, switch the controls so that the wiping system operates at the lowest sweep frequency. Measure the minimum sweep frequency per minute. If the measured results fail to comply with the requirements provided for in Paragraph 4–1, it is permissible to measure the minimum sweep frequency with the wiping system set to the intermittent mode, provided that an intermittent mode wherein the sweep frequency is 10 frequencies or more per minute can be set in the wiping system.

(6) Stop the operation of the wiping system. Confirm the blade position of the wiper.

3–1–3 Forced stalling test

The test shall be conducted, following the procedure given below:

(1) Start the power generation system of the test vehicle. In this case, if the wiping system of the test vehicle is an electric type, the following conditions given below (except Item ① in the case of fuel cell vehicles) shall be satisfied:

① The engine shall be in an unloaded state during the test. The revolution speed of the engine shall not exceed a speed that is obtained when the maximum output revolution speed is multiplied by 0.3. In this case, if the test vehicle is equipped with an engine tachometer, the tachometer may be used to measure the revolution speed of the engine.

② The headlamps of the test vehicle shall be turned ON and dipped;

③ The controls of the air-conditioning devices (heating device, ventilating device and defroster, etc.) of the test vehicle shall be set to an operating position where maximum air flow is obtained.
The devices shall be operated.

④ If a defroster for the windshield glass, other than the air conditioning, is provided on the test vehicle, the device concerned shall be operated in such a way that its power consumption may become the maximum.

(2) Operate the wiping system at the highest sweep frequency or speed. Restrain the wiper arm at the driver's seat side, for example, by seizing it by hand when the wiper is about to reverse its direction of movement after it has swung fully from the initial position. Hold the arm still for a duration of 15 seconds.

(3) Release the arm. Allow the wiping system to operate for a while and then turn it off. Confirm the blade position at this time. However, if a safety device (e.g. automatic circuit protecting device or circuit breaker) has been actuated and the operation of the wiping system stops while the arm was being seized, reset the safety device and allow the wiping system to operate for a while. Then turn off the wiping system. Confirm the blade position of the wiping system at this time.

3–1–4 Wiped area measurement test

The test shall be conducted, following the procedure given below:

(1) Prior to the test, the outside face of the windshield of the test vehicle shall be cleaned and dried so that no grease or foreign matter, etc. may remain on the glass surface.

(2) Draw contours of the Zones A and B on the inside face of the windshield.

(3) Prepare a solution by mixing the components prescribed in the left

column of Table 2 in the respective volumetric ratio specified in the right column of the table. Apply this mixing solution evenly to the outside face of the windshield and allow the surface to dry. Or treat the outside face of the windshield, using a similar method.

Table 2 Components of mixing solution and volumetric ratio

Mixing solution components	Volumetric ratio (%)
Water having hardness of not more than 205 mg $CaCO_3$ / *l*	92.5
Saturated salt water	5
Test dust of grade 7 or 8 test powder specified in JIS Z 8901, or test dust meeting requirements of Table 3 and Table 4	2.5

Table 3 Dust composition

Component	Mass ratio (%)
SiO_2	67 ~ 69
Fe_2O_3	3 ~ 5
Al_2O_3	15 ~ 17
CaO	2 ~ 4
MgO	0.5 ~ 1.5
Total alkali	3 ~ 5
Ignition loss	2 ~ 3

Table 4 Mass distribution of grain size of coarse dust

Grain size (μm)	Mass distribution rate (%)
0 ~ 5	12 ± 2
5 ~ 10	12 ± 3
10 ~ 20	4 ± 3
20 ~ 40	23 ± 3
40 ~ 80	30 ± 3
80 ~ 200	9 ± 3

(4) Start the power generation system of the test vehicle. In this case, if the wiping system of the test vehicle is of an electric type, the following conditions given below (except Item ① in the case of fuel cell vehicles) shall be satisfied:

① The engine shall be in an unloaded state during the test. The

revolution speed of the engine shall not exceed a speed that is obtained when the maximum output revolution speed is multiplied by 0.3. In this case, if the test vehicle is equipped with an engine tachometer, the tachometer may be used to measure the revolution speed of the engine.

② The headlamps of the test vehicle shall be turned ON and dipped;

③ The controls of the air-conditioning devices (heating device, ventilating device and defroster, etc.) of the test vehicle shall be set to an operating position where maximum air flow is obtained.
The devices shall be operated.

④ If a defroster for the windshield glass, other than the air conditioning, is provided on the test vehicle, the device concerned shall be operated in such a way that its power consumption may become the maximum.

(5) Operate the wiping system at the lowest sweep frequency for a duration not exceeding 10 cycles. In this case, water may be sprayed on the outside face of the windshield, using a spray, etc., but not to the extent that the dust is washed away by the force of the spray.

(6) Measure the area on the outside face of the windshield which can be perceived as having been wiped by the wiping system and which is enclosed by the respective contours of the Zones A and B in Item (2).

3–1–5 Low-temperature test

The test shall be conducted, following the procedure given below:

(1) Prior to the test, the outside face of the windshield of the test vehicle shall be cleaned and dried so that no grease or foreign matter, etc. may remain on the glass surface.

(2) The test vehicle, with the power generation system stopped, shall be conditioned in an environmental temperature of −18 ± 3°C for at least 4 hours. However, if it is confirmed that the engine coolant and lubricant (the engine coolant, cooling oil or coolant of the fuel cell stack in the case of fuel cell vehicles) have stabilized at a temperature of −18 ± 3°C, this conditioning time may be shortened.

(3) Start the power generation system of the test vehicle. However, the test may be conducted without operating the power generation system. In

this case, a voltage may be applied to the electrical system of the test vehicle by means of an external power supply. Moreover, if the wiping system of the test vehicle is of an electric type, the following conditions given below (except Item ① in the case of fuel cell vehicles) shall be satisfied:

① In cases where the engine of the test vehicle is operated, the engine shall be in an unloaded state during the test. The revolution speed of the engine shall not exceed a speed that is obtained when the maximum output revolution speed is multiplied by 0.3. However, this requirement shall not apply to cases where the revolution speed of the engine automatically rises owing to operation of an idle speed automatic adjusting device, etc. In this case, if the test vehicle is equipped with an engine tachometer, the tachometer may be used to measure the revolution speed of the engine.

② In cases where voltage is applied to the electrical system of the test vehicle by means of an external power supply, the voltage concerned shall not exceed a voltage that is generated by the vehicle's own electric generator when the engine of the test vehicle is operated under the condition provided for in Item ① above. In the case of fuel cell vehicles, the voltage shall not exceed the voltage supplied during the normal running.

③ The headlamps of the test vehicle shall be turned ON and dipped;

④ The controls of the air-conditioning devices (heating device, ventilating device and defroster, etc.) of the test vehicle shall be set to an operating position whereby maximum air flow is obtained.
The devices shall be operated.

⑤ If a defroster for the windshield glass, other than the air conditioning, is provided on the test vehicle, the device concerned shall be operated in such a way that its power consumption may become the maximum.

(4) Operate the wiping system at the highest sweep frequency for 2 minutes or more. Observe the operating conditions at this time.

3–1–6 Sweep performance test during high-speed running

The test shall be conducted, following the procedure given below. The test may be carried out by running the test vehicle on a proving ground or in a wind tunnel.

(1) Prior to the test, the outside face of the windshield of the test vehicle shall be cleaned and dried so that no grease or foreign matter, etc. may remain on the glass surface.

(2) Draw the contour of Zone A on the inside face of the windshield.

(3) Prepare a solution by mixing the components prescribed in the left column of the Table 2 in the respective volumetric ratio specified in the right column of the table. Apply this mixing solution evenly to the outside face of the windshield (it is only required to include Zone A) and allow the surface to dry. Or treat the outside face of the windshield, using a similar method.

(4) Run the test vehicle at a speed of 80% V_{MAX} (referring to a speed that is obtained when the maximum speed is multiplied by 0.8. However, 120 shall be the upper limit) ± 5 km/h. Or place the test vehicle in a wind tunnel and set the relative wind velocity at the windshield to the same value as the running conditions prescribed above. Furthermore, in cases where the test vehicle is ran on a proving ground, the speedometer mounted on the test vehicle may be used to measure the vehicle speed. Also, in cases where the mean wind velocity in the running direction of the test vehicle exceeds 5 m/s, the running speed shall be adjusted so that the relative wind velocity at the windshield becomes a speed of 80% V_{MAX} ± 5 km/h. In cases where the mean wind velocity in the direction perpendicular to the running direction of the test vehicle exceeds 5 m/s, in principle, no test shall be conducted. Moreover, in cases where the test is conducted by placing the test vehicle in a wind tunnel, a voltage may be applied to the electrical system of the test vehicle by means of an external power supply. In this case, the voltage concerned shall not exceed a voltage generated by the vehicle's own generator at a time when the test vehicle is running at a speed of 80% V_{MAX} ± 5 km/h (the gear shift position of the transmission shall be the highest position suitable for running at a speed of 80% V_{MAX} ± 5 km/h.). In the case of fuel cell vehicles, the voltage shall not exceed the voltage supplied to the electrical system of the windshield wipers when the test vehicle is running at a speed of 80% V_{MAX} ± 5 km/h.

(5) While the washing fluid (water) is being injected, operate the wiping system 5 cycles or more at the highest sweep frequency. At this time, visually observe the wiping condition of the wiping system from around the driver's seat.

(6) Measure the area on the outside face of the windshield which can be

perceived as having been wiped by the wiping system and is enclosed by the contour of Zone A in Item (2).

3–2 Washing system

3–2–1 Test specimen

The test specimen will be a sample vehicle or a system in which the windshield washing system, wiping system, and windshield are mounted on a test bench in a way that is nominally used on the test vehicle. (The hoses and other equipment may be arranged in a coiled condition.)

3–2–2 General test conditions

The temperature of the test site shall be a normal temperature (between 5°C and 40°C), unless otherwise specified.

3–2–3 Washing capability test

The test shall be conducted, following the procedure given below:

(1) Prior to the test, the outside face of the windshield of the test specimen shall be cleaned and dried so that no grease or foreign matter, etc. may remain on the glass surface.

(2) Draw the contour of Zone A on the inside face of the windshield.

(3) Prepare a solution by mixing the components prescribed in the left column of the Table 2 in the respective volumetric ratio specified in the right column of the table. Apply this mixing solution evenly to the outside face of the windshield and allow the surface to dry. Or treat the outside face of the windshield, using a similar method.

(4) While the washing fluid (water) is being injected, operate the wiping system for a duration of not more than 10 cycles in succession.
If the wiping system is of a variable-frequency type, operate the wiping system at the highest sweep frequency. However, for a windshield washing system where the injection of the washing fluid (water) is interspersed with the wiper movement, the injection of the washing fluid may be suspended during the operation and afterwards the wiping system may be operated at the slowest sweep frequency.

(5) Measure the area of the outside face of the windshield which can be perceived as having been washed and wiped by means of the windshield

washing system and wiping system and is enclosed by the contour of Zone A in Item (2). When evaluating the washing test results, the entire area (except for the section which can be perceived as an apparently non-washed section from around the eyepoints) shall be regarded as the washed area. Furthermore, the area covered by the dripping of the mixing solution occurring after the wiper operation shall not be regarded as a non-washed area.

3–2–4 Injection capability and plugging-withstanding tests

3–2–4–1 General rules

The tests prescribed in Paragraphs 3–2–4–2 through 3–2–4–7 shall be conducted on the same test specimen.

3–2–4–2 Plugging-withstanding test

Fill the reservoir of the washing system with water to the specified capacity. Place the washing system in an environmental temperature of 20 ± 5°C for a minimum of 4 hours. Afterward, verify the plugging-withstanding characteristic of the washing system. Next, verify the injection capability of the washing system.

3–2–4–3 Freezing strength test

The test shall be conducted, following the procedure given below:

(1) Fill the reservoir of the washing system with water to the specified capacity. Place the washing system in an environmental temperature of

– 18 ± 3°C for a minimum of 4 hours. Afterwards, operate the washing system at a rate of 6 times per minute (each time for at least 3 seconds).

(2) Place the washing system in an environmental temperature of 20 ± 5°C, until the ice in the washing system has completely thawed. Afterward, verify the injection capability of the washing system.

3–2–4–4 Freezing/thawing repetition test

The test shall be conducted, following the procedure given below:

(1) Fill the reservoir of the washing system with water to the specified capacity. Place the washing system in an environmental temperature of

– 18 ± 3°C for a minimum of 4 hours so that all water in the reservoir of the washing system freezes.

(2) Place the washing system in an environmental temperature of 20 ± 5°C, until the ice in the washing system has completely thawed.

(3) Repeat the freezing/thawing procedure provided for in Items (1) and (2) another 5 times. Afterward, verify the injection capability of the washing system.

3–2–4–5 Low-temperature operation test

Fill the reservoir of the washing system to the specified capacity with washing fluid for low-temperature use. Place the washing system in an environmental temperature of – 18 ± 3°C for a minimum of 4 hours. Then, verify the injection capability of the washing system at this environmental temperature.

3–2–4–6 High-temperature exposure test

The test shall be conducted, following the procedure given below:

(1) Fill the reservoir of the washing system with water to the specified capacity. Place the washing system in an environmental temperature of 80 ± 3°C for a minimum of 8 hours.

(2) Then, place the washing system in an environmental temperature of 20 ± 5°C, until the water temperature has stabilized. Then, verify the injection capability of the washing system.

3–2–4–7 High-temperature operation test

Fill the reservoir of the washing system with water to the specified capacity. Place the washing system in an environmental temperature of 80 ± 3°C (60 ± 3°C, if no part of the washing system is located in the engine compartment) for a minimum of 8 hours. Then, verify the injection capability of the washing system at this environmental temperature.

4. Requirements

4–1 Wiping system

4–1–1 Sweep frequency test

When subjected to the test prescribed in Paragraph 3–1–2, the wiping system shall comply with the following requirements given below:

(1) The maximum sweep frequency shall be 45 cycles or more per minute. Furthermore, the minimum sweep frequency shall be 10 cycles or more per minute.

(2) The difference between the maximum sweep frequency and the minimum sweep frequency shall be 15 cycles or more per minute.

(3) The blade position of the wiper shall automatically return to the initial position.

4–1–2 Forced stalling test

When subjected to the test prescribed in Paragraph 3–1–3, the wiping system shall continually function. Furthermore, when its operation stops, the blade position of the wiper shall automatically return to the initial position.

4–1–3 Wiped area measurement test

When subjected to the test prescribed in Paragraph 3–1–4, the area of the outside face of the windshield which can be perceived as having been wiped by means of the wiping system shall include 98% or more of Zone A and 80% or more of Zone B.

4–1–4 Low-temperature test

When subjected to the test prescribed in Paragraph 3–1–5, the wiping system shall function for at least 2 minutes.

4–1–5 Sweep performance test during high-speed running

When subjected to the test prescribed in Paragraph 3–1–6, the area of washing fluid in Zone A wiped by the wiping system, excluding parts missed owing to floating of the blade (except streaks of the washing fluid that remain during the wiping) shall include 98% or more of the area of Zone A.

4–2 Washing system

4–2–1 Washing capability test

When subjected to the test prescribed in Paragraph 3–2–3, the washing system shall be capable of delivering washing fluid in an adequate quantity so

that the area on the outside of the windshield which can be perceived as having been washed and wiped by the windshield washing system and wiping system is 60% or more of Zone A.

4–2–2 Injection capability and clogging-withstanding tests

When subjected to the respective tests prescribed in Paragraphs 3–2–4–2 through 3–2–4–7, the washing system shall have injection capability and plugging-withstanding characteristics (limited to the test in Paragraph 3–2–4–2 only).

ANNEX 1

DETERMINING PROCEDURE FOR "ZONE A" AND "ZONE B"

1. Definitions

1–1 "Seatback angle" means the backward inclination angle of the torso reference line in the occupant seating condition. Therefore, the seatback angle means an angle of the torso line to the vertical line when the human manikin is seated in accordance with Paragraph 2–10 in this Technical Standard or the equivalent design standard angle.

1–2 "Point V1" and "Point V2" means the two representative vertical points when the results of distributions of eye positions of drivers are processed statistically. Point V1 and point V2 are those points which are determined when corrections in a fore-and-aft direction and in a vertical direction are made by the correction distance from the respective points that are determined as specified in Table 1 (hereinafter referred to as "the reference points"). Table 2 shows these correction distances in accordance with the seatback angle of the driver's seat of the test vehicle.

Table 1 Positions of reference points

(Units: mm)

	Rearward of R-point	Vehicle outboard of R-point	Upward of R-point
Point V1	68	5	665
Point V2	68	5	589

Table 2 Correction distance from reference points

(Unit: mm)

Seat-back angle (degree)	Correction distance		Seat-back angle (degree)	Correction distance	
	Fore-and-aft direction	Up-and-down direction		Fore-and-aft direction	Up-and-down direction
5	– 186	+ 28	23	– 18	+ 5
6	– 177	+ 27	24	– 9	+ 3
7	– 167	+ 27	25	0	0
8	– 157	+ 27	26	+ 9	– 3
9	– 147	+ 26	27	+ 17	– 5
10	– 137	+ 25	28	+ 26	– 8
11	– 128	+ 24	29	+ 34	– 11
12	– 118	+ 23	30	+ 43	– 14
13	– 109	+ 22	31	+ 51	– 18
14	– 99	+ 21	32	+ 59	– 21
15	– 90	+ 20	33	+ 67	– 24
16	– 81	+ 18	34	+ 76	– 28
17	– 72	+ 17	35	+ 84	– 32
18	– 62	+ 15	36	+ 92	– 35
19	– 53	+ 13	37	+ 100	– 39
20	– 44	+ 11	38	+ 108	– 43
21	– 35	+ 9	39	+ 115	– 48
22	– 26	+ 7	40	+ 123	– 52

Note: Regarding prefixed signs of correction distances, the “+” sign represents a rearward direction or upward direction, whereas the “–” sign represents forward or downward direction.

2. Conditions of test vehicle

The conditions of the test vehicle shall mean conditions in which passengers of the riding capacity (assuming that the mass of each passenger of the riding capacity is 55 kg) are riding in the test vehicle in an unloaded state placed on a level floor or equivalent conditions. (In the case of a motor vehicle equipped with suspension units which make it possible to adjust the minimum ground clearance of the test vehicle, the suspension units shall be adjusted so that the minimum ground clearance is the design standard value.) Here, passengers are seated in the driver’s seat and, of other seats in parallel thereto, in the seat next to the side of the motor vehicle.

3. Determining procedure for “Zone A” and “Zone B”

3–1 Determining procedure for “Zone A”

In cases where the driver’s seat is located on the right side (including the centre) of the motor vehicle, Zone A means the area on the outside face of the windshield (limited only to the sections of the windshield which are not covered by glass retaining members or decorative members, and through which light can pass (hereinafter referred to as the “light transmitting section”) hereinafter the same) that is enclosed by the following four planes enumerated in Items (1) through (4) defined below. Furthermore, in cases where the driver’s seat is located at the left side, the “left side” shall read the “right side,” while the “right side” shall read the “left side” in the following Items (1) through (4).

(1) A vertical plane passing through the point V1 and point V2 and at an angle of 13° to the right side of the longitudinal centre line of the motor vehicle;

(2) A vertical plane passing through the point V1 and point V2 and at an angle of 20° to the left side of the longitudinal centre line of the motor vehicle;

(3) A plane passing through the point V1 and at an upward angle of 3° from the horizontal plane;

(4) A plane passing through the point V2 and at a downward angle of 1° from the horizontal plane.

3–2 Determining procedure for “Zone B”

In cases where the driver’s seat is located at the right side (including the centre) of the motor vehicle, Zone B means the area on the outside face of the windshield (except the sections within 25 mm from the outer edge of the light transmitting section of the windshield) that are enclosed by the following four planes enumerated in Items (1) through (4) defined below. Furthermore, in cases where the driver’s seat is located at the left side, the “left side” shall read the “right side,” while the “right side” shall read the “left side” in the following Items (1) through (4).

(1) A vertical plane passing through the point V1 and point V2 and at an angle of 17° to the right side of the longitudinal centre line of the motor vehicle;

(2) A plane symmetrical to the plane described in Item (1) in relation to the vertical plane including the longitudinal centre line of the motor vehicle;

(3) A plane passing through the point V1 and at an upward angle of 7° from the horizontal plane;

(4) A plane passing through the point V2 and at a downward angle of 5° from the horizontal plane.