

KES

Rear Combination Lamp

KES D-C044

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Appendix



1. Purpose

This standard aims at securing proper quality by standardizing specifications.

Remark: This standard and a drawing communicate together our requirements.

2. Scope of Application

This standard specifies the rear combination lamp for automobiles (hereinafter referred to as the "lamp").

3. Report of Evaluation Result

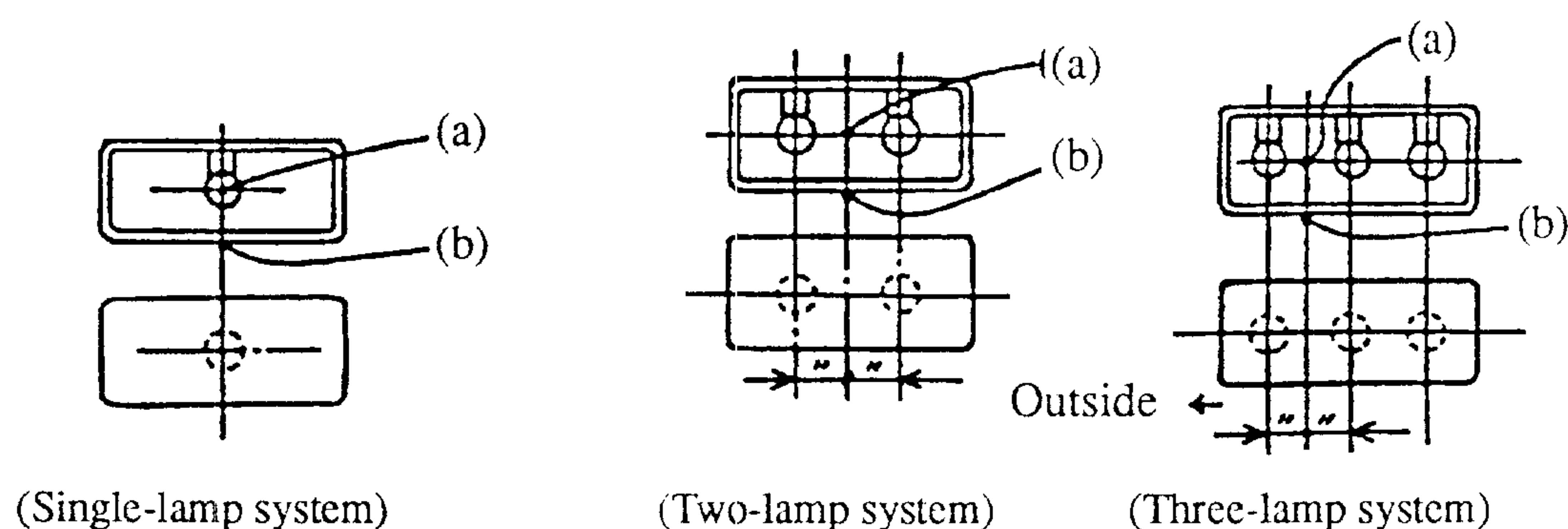
The quality evaluation results at each stage from development to mass production shall be submitted to KIA or MMUC according to the Appendix.

4. Definition of Terminology

(1) Optical center

- (a) Korea and US specifications: The bulb filament center for single-lamp system. The middle point between the bulb filament centers on both end lamps for two-lamp or three-lamp system.
- (b) Europe specification: The intersecting point of the reference line through the bulb center and the lens surface for single-lamp system. The middle point between the intersecting points of reference lines through bulb centers on both end lamps and the lens surfaces for two-lamp or three-lamp system. The center of the first filament when one bulb has plural filaments.
- (c) As to the reflex reflector, the center of the front lens face composed in a body with reflector element for every specification for Korea, US and Europe.

Fig. 1



- (2) Main optical axis: The axis connecting the maximum luminous point and the optical center.

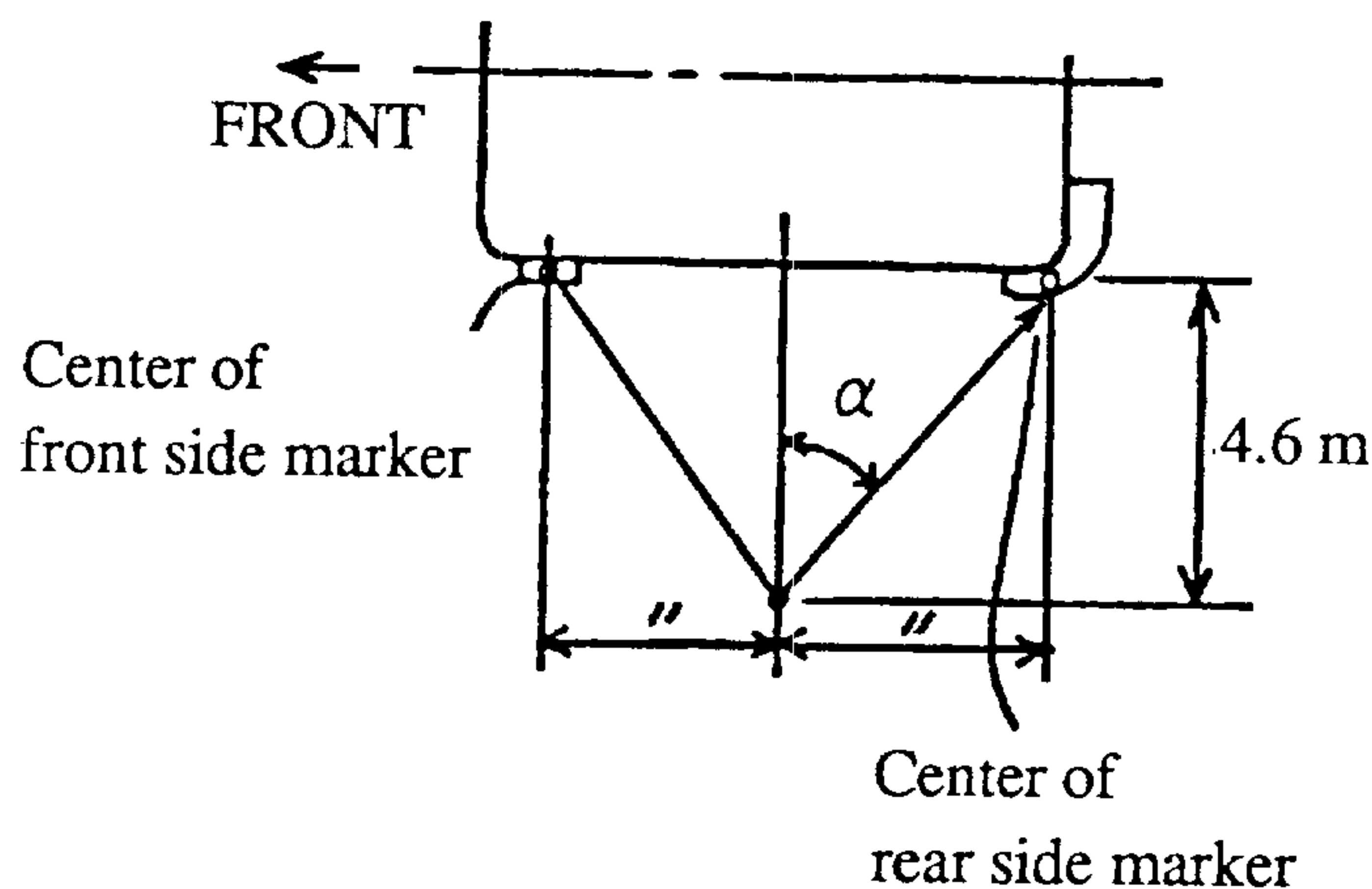
5. Specifications Indicated in Drawings

- (1) Assembling condition*, mating parts and the tolerances, peripheral parts.

* The limit of the tolerance

- (2) Application of rear turn signal lamp for Australia (Because the luminous intensity distribution requirement differs in category, the indication of a passenger car or a non-passenger car shall be entered.)
- (3) Conditions of alleviatory regulation for luminous intensity distribution of rear side marker lamp (For a vehicle of which the width is less than 2032 mm, the angle, α , shown in Fig. 2 shall be indicated.)

Fig. 2

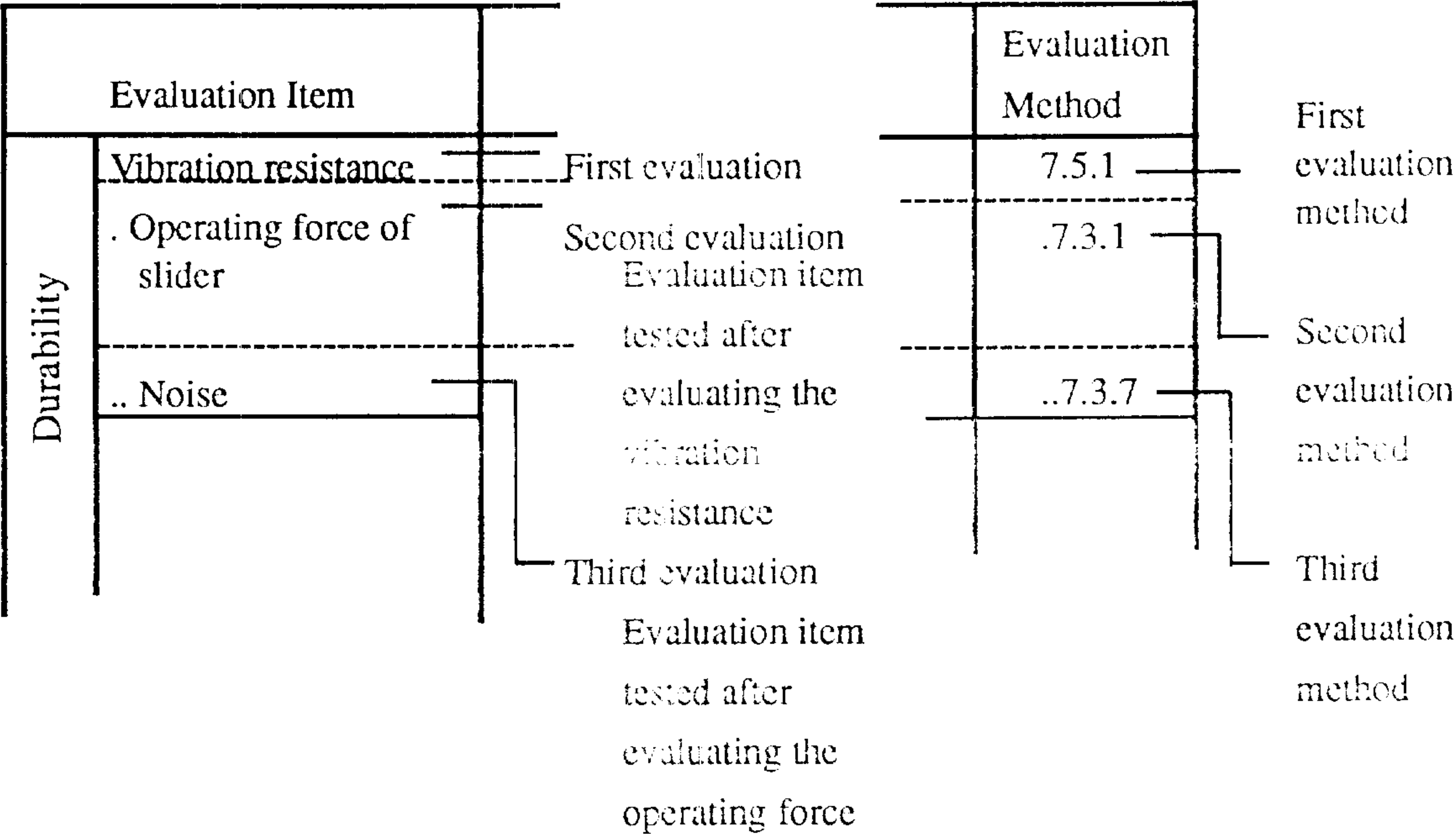


- (4) Direction of main optical axis of back-up lamp and its height from the ground in a curb (Only for Korea specification)
- (5) Grade of vibration test [grade 4 (passenger car) or grade 7 (truck)]
- (6) When painting applied, painting specification and area
- (7) When plating applied, plating specification and area
- (8) Indication of painting color or material coloration
Indication of part colors
- (9) Kind, area and depth of grain
- (10) Rigidity (the one below the evaluation standard because of the lamp construction)
- (11) Destination (required specification for each destination on chromium plating, zinc plating, etc.)

6. Evaluation Standard

The evaluation standard of the lamp shall conform to Table 1.

Remark 1. The way of reading evaluation items and methods in Table 1 shall conform to the following example.



Remark 2. The quality rank shall be represented by A, AR, B or C.
The definitions shall conform to KES Q-A002 (Determination and Procedure of Quality Ranking).

Table 1

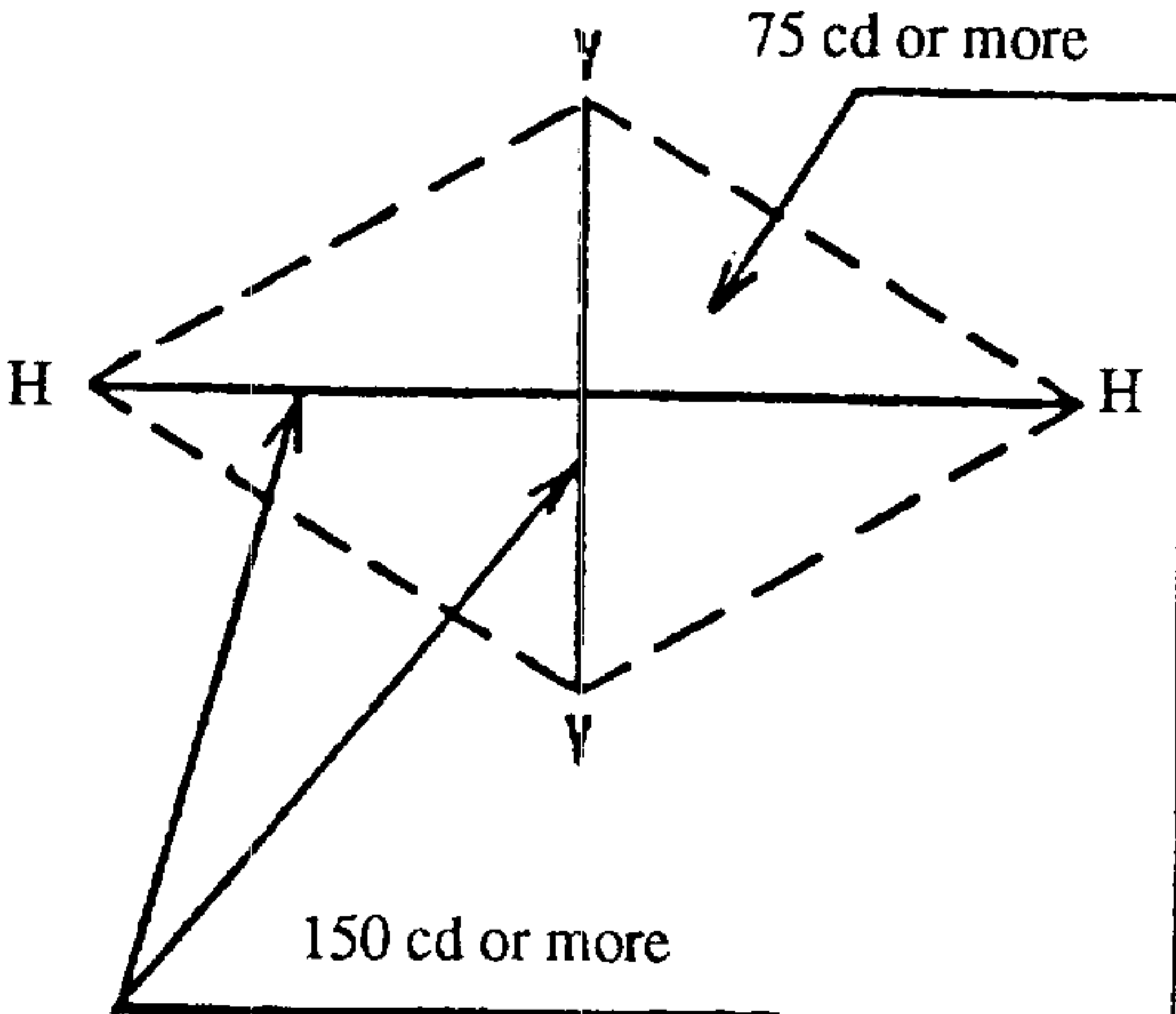
Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Basic performance	Luminous intensity distribution of back-up lamp	To conform to Table 2.	AR	7.2.1
	Luminous intensity distribution of tail lamp	To conform to Table 3.	AR	
	Luminous intensity distribution of tail lamp	To conform to Table 4.	AR	
	Luminous intensity distribution of rear turn signal lamp	To conform to Table 5.	AR	
	Luminous intensity distribution of rear parking lamp	To conform to Table 6.	AR	
	Luminous intensity distribution of rear side marker lamp	To conform to Table 7.	AR	
	Luminous intensity distribution of rear fog lamp	The luminous intensity along axes. H and V between each 10° on right and left sides and between each 5° on up and down sides shall be 150 cd or more. The luminous intensity between axes shall be 75 cd or more. The luminous intensity of radiant light in all observable directions shall be 300 cd or less. 	AR	

Table 1 (Continued)

	Evaluation Item	Evaluation Standard	Quality Rank	Evaluation Method
Basic performance	Reflection property of rear reflex reflector	To conform to Table 8.	AR	7.2.2
	Reflection property of rear side reflex reflector	To conform to Table 9.	AR	
	Color of lamp light and reflected light	Within the chromaticity range shown in Table 10	AR	7.2.3
	Light emitting and reflecting areas	The areas shown in Table 11 or more	AR	By calculation
	Main optical axis of back-up lamp (only for Korea specification)	As specified in a drawing.	AR	7.2.4
	Light leakage (only for Korea specification)	0.1 cd or less This test shall not apply to the combination of lamps of same colors or of same function.	AR	7.2.5
	Water-proof, cloud-proof	1. No water intrusion into the lamp. No water intrusion through the partition that separates the body from outside. 2. No cloud on lens inside face.	AR	7.2.6
	Insulation resistance	1 M Ω or more	B	7.6.3
	Corrosion resistance	No occurrence of rust on the portions easily seen in car-mounted condition.	B	7.2.7
	Rigidity	1. The deflection on the contact area shall be 3.5 mm or less only when lift gate or trunk lid is opened. 2. The deflection on the contact area shall be 0.5 mm or less when lift gate or trunk lid is closed. 3. However, the one below the above 1 and 2 in lamp construction shall be as indicated in a drawing.	B	7.2.3

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Basic performance	Noise	No noise.	C	7.2.9
	Paint film	As specified in a drawing.	B	KES T-M010
Surface treatment	Plating	As specified in a drawing.	B	KES C-F002
	Shrinkage	According to an acceptance sample.	B	Visually
Appearance	Weld	According to an acceptance sample.	B	Visually
	Parting line	The step in visible area shall be 0.3 mm or less in car-mounted condition.	B	—
	Lighting feeling	According to a standard sample.	C	Visually
	Color, grain, gloss, etc.	The paint color, material color, grain and gloss shall conform to a standard sample.	C	Visually
	Other appearance	No flaws, crack, orange peel, unevenness, wrinkle nor other defects.	B	Visually
	Attachability for back cover	1. The back cover shall be attached only in the condition specified in a drawing. 2. Back cover shall be attached at one-touch. The clearance after attaching shall be 0.7 mm or less.	B	—
Serviceability	Attachability for bulb socket	The attaching or detaching torque shall be 3 - 10 kgf.cm {29.4 - 98.1 N} cm. The bulb socket shall be soundly attached. No clearance after attaching.	B	—
	Lens strength	No occurrence of crack on lens.	B	7.3.1
Strength	Tightening strength	No breaking nor idling of screw.	B	7.3.2
	Vibration resistance	No deformation, looseness, nor crack in structure part. No breakage of filament, malcontact nor other detrimental defects.	B	7.3.3

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Strength	. Water-proof, cloud-proof	1. No water intrusion into lamp. No water intrusion through the partition that separates the body from outside. 2. No cloud on lens inside face.	B	.7.2.6
	. Noise	No noise.	C	.7.2.9
	Impact resistance	No defects such as deformation and loosening of each part, rotation and fall down of lens, breakage of supporting parts. However, the filament breakage is permissible.	AR (Only for US spec.) B (For spec. except US one)	.7.3.4
	. Optical axis of back-up lamp	As specified in a drawing.	AR	.7.2.4
	. Water-proof, cloud-proof	1. No water intrusion into lamp. No water intrusion through the partition that separates the body from outside. 2. No cloud on lens inside face.	AR	.7.2.6
	. Noise	No noise.	C	.7.2.9
	Attaching strength of back cover	No slip-off.	B	.7.3.5
Environmental resistance	Short-term heat resistance	To conform to KES D-GC08, HS-02, A2, B1.	B	KES D-GC08
	. Noise	No noise.	C	.7.2.9
	Long-term heat resistance	To conform to KES D-G008, H 0 -E, A2, B1.	B	KES D-G008
	. Optical axis of back-up lamp	As specified in a drawing.	AR	.7.2.4
	. Noise	No noise.	C	.7.2.9
	Thermal shock resistance	To conform to KES D-GC08, Th-02D, A2, B1.	B	KES D-GC08

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance	Noise	No noise.	C	7.2.9
	Weatherability (Applied only to material coloration)	To conform to KES D-G008, We-0,C	B	KES D-G008 A test piece shall be the flat plate of 150 x 50 mm.
	Dust-proof	Drop in max. luminous intensity shall be 10% or less.	AR	7.4.1
	Lighting heat resistance (Stop lamp)	No heat deformation to affect the appearance or function of lamp.	B	7.4.2
	Thermal resisting property	No remarkable defect to affect the function on the lens, such as softening, crack, distortion, deterioration of luster.	B	7.4.3
	Ozone resistance	No occurrence of cracks on gasket in visible area in car-mounted condition.	B	7.4.4
Chemical resistance	Chemical resistance	1.To conform to KES D-G008, Cr-E, O. 2. No crack on lens.	C	7.5.1
	Stress cracking resistance	The degree of crack on the test piece in test liquid B shall be equivalent to or less than that on the test piece in test liquid A.	C	7.5.2
Electrical performance	Jumper start resistance	No smoking, deformation nor discoloration of resin part. (The breaking of filament is permissible.)	B	7.6.1
	Abnormal voltage resistance	No igniting. (The breaking of filament is permissible.)	B	7.6.2
	Insulation resistance	1 MΩ or more	B	7.6.3

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Others	Peeling of gasket	Peeling of gasket shall be 10 mm or less.	C	7.7.1
	Damages in transportation	No deformation, breaks nor coming-off.	C	—
	Coupler	The housing lance type coupler shall be used. (Except cape terminal, direct insertion terminal and AMP-made 110 fasten type connector.)	C	—
	Lead wire strength	No damage, looseness nor solder separation.	C	7.7.2
	Marking	The followings shall be indelibly marked on the lamp: 1. Type No. 2. Manufacturer's name 3. Items necessary for certification 4. Bulb category name 5. DOT mark 6. SAE mark (SAEJ759) 7. Lot No. 8. Material 9. Assembly tag	AR	Visually

Table 2 Luminous intensity distribution of back-up lamp

Unit: cd

Specification Measuring Point		Korea *1	US *2 (SAE J593C)	Europe	Australia
10 U	10L	5 min	10 min	10 min	—
	V	7 min	15 min	15 min	—
	10R	5 min	10 min	10 min	—
5 U	45L	—	15 min	15 min	—
	10L	10 min	20 min	20 min	—
	V	12 min	25 min	25 min	—
	10R	10 min	20 min	20 min	—
	45R	—	15 min	15 min	—
H	45L	—	15 min	15 min	—
	30L	—	25 min	25 min	—
	10L	25 min	50 min	50 min	50 min
	V	40 min	80 min	80 min	—
	10R	25 min	50 min	50 min	—
	30L	—	25 min	25 min	—
	45R	—	15 min	15 min	—
5 D	45L	—	15 min	15 min	—
	30L	—	25 min	25 min	—
	10L	25 min	50 min	50 min	—
	V	40 min	80 min	80 min	—
	10R	25 min	50 min	50 min	—
	30L	—	25 min	25 min	—
	45L	—	15 min	15 min	—
MAXIMUM		5000 max	—	600 max	—
H LINE ABOVE MAX		300 max	500 max or 300 max	300 max	700 max

- *1 (Korea specification)
- (1) The maximum luminous point shall be on or below H line.

(2) When only 1 back-up lamp is attached to a vehicle, the minimum luminous intensity of the lamp shall be twice the value shown in Table 2.

(3) When two lamps of different type in design (ex. in photometric design) are attached to a vehicle, each lamp is measured at each measuring point and judgement is made on the sum of the values obtained at each point, considering twice the luminous intensity shown in Table 2 as the minimum luminous intensity.
- *2 (US specification)
- (1) The maximum luminous intensity on or below H line per 1 lamp shall be 300 cd for two-lamp system and 500 cd for single-lamp system.

Table 3 Luminous intensity distribution of tail lamp

		Unit: cd						
Measuring Point	Specification	Korea			US (SAE J585e)			Europe
		Single-lamp	Two-lamp	Three-lamp	Single-lamp	Two-lamp	Three-lamp	
10 U	10 L	0.3 min	0.5 min	0.7 min	—	—	—	—
	5 L	—	—	—	0.4 min	0.7 min	1.0 min	0.4 min
	V	0.5 min	1.0 min	1.5 min	—	—	—	—
	5 R	—	—	—	0.4 min	0.7 min	1.0 min	0.4 min
	10 R	0.3 min	0.5 min	0.7 min	—	—	—	—
5 U	20 L	0.3 min	0.5 min	0.7 min	0.3 min	0.53 min	0.75 min	0.2 min
	10 L	0.8 min	1.3 min	2.0 min	0.8 min	1.4 min	2.0 min	0.4 min
	5 L	1.3 min	2.0 min	3.0 min	—	—	—	—
	V	1.8 min	3.0 min	4.5 min	1.8 min	3.2 min	4.5 min	1.4 min
	5 R	1.3 min	2.0 min	3.0 min	—	—	—	—
	10 R	0.8 min	1.3 min	2.0 min	0.8 min	1.4 min	2.0 min	0.4 min
	20 R	0.3 min	0.5 min	0.7 min	0.3 min	0.53 min	0.75 min	0.2 min
H	20 L	0.4 min	0.7 min	1.0 min	—	—	—	—
	10 L	0.8 min	1.3 min	2.0 min	0.8 min	1.4 min	2.0 min	0.7 min
	5 L	2.0 min	3.5 min	5.0 min	2.0 min	3.5 min	5.0 min	1.8 min
	V	2.0 min	3.5 min	5.0 min	2.0 min	3.5 min	5.0 min	2.0 min
	5 R	2.0 min	3.5 min	5.0 min	2.0 min	3.5 min	5.0 min	1.8 min
	10 R	0.8 min	1.3 min	2.0 min	0.8 min	1.4 min	2.0 min	0.7 min
	20 R	0.4 min	0.7 min	1.0 min	—	—	—	—
5 D	20 L	0.3 min	0.5 min	0.7 min	0.3 min	0.53 min	0.75 min	0.2 min
	10 L	0.8 min	1.3 min	2.0 min	0.8 min	1.4 min	2.0 min	0.4 min
	5 L	1.3 min	2.0 min	3.0 min	—	—	—	—
	V	1.3 min	3.0 min	4.5 min	1.8 min	3.2 min	4.5 min	1.4 min
	5 R	1.3 min	2.0 min	3.0 min	—	—	—	—
	10 R	0.8 min	1.3 min	2.0 min	0.8 min	1.4 min	2.0 min	0.4 min
	20 R	0.3 min	0.5 min	0.7 min	0.3 min	0.53 min	0.75 min	0.2 min
10 D	10 L	0.3 min	0.5 min	0.7 min	—	—	—	—
	5 L	—	—	—	0.4 min	0.7 min	1.0 min	0.4 min
	V	0.5 min	1.0 min	1.5 min	—	—	—	—
	5 R	—	—	—	0.4 min	0.7 min	1.0 min	0.4 min
	10 R	0.3 min	0.5 min	0.7 min	—	—	—	—
Max. luminous Intensity above H line		15 max	20 max	25 max	18 max	20 max	25 max	12 max
Min. luminous Intensity within obtained angle range		—						0.3 min Vertical: Within 15° Inside: Within 45° Outside: Within 80°

Remarks 1. Korea specification

- (1) The maximum luminous intensity denotes the value within the area from H to 10 U and from 20 L to 20 R.
- (2) The values in Table 3 apply to the luminous intensity of tail lamps of two-lamp system and three-lamp system when the distance between the filament centers of two adjacent lamps is not exceeding 560 mm for two-lamp system, or 405 mm for three-lamp system. When the distance between filament centers is exceeding the above stated values, the values for single-lamp system given in Table 3, apply to each light source.

2. US specification

The values in Table 3 apply to the luminous intensity of tail lamps of two-lamp system and three-lamp system when the distance between the filament centers of two adjacent lamps is not exceeding 560 mm for two-lamp system, or 410 mm for three-lamp system. When the distance between filament centers is exceeding the above stated values, the values for single-lamp system given in Table 3, apply to each light source.

Table 4 Luminous intensity distribution of stop lamp

Unit: cd

Specification Measuring Point		Korea	US			Europe
		—	Single-lamp	Two lamp	Three-lamp	
10 U	10 L	—	—	—	—	—
	5 L	—	16 min	19 min	22 min	8 min
	V	—	—	—	—	—
	5 R	—	16 min	19 min	22 min	8 min
	10 R	—	—	—	—	—
5 U	20 L	—	10 min	11.9 min	13.8 min	4 min
	10 L	15 min	30 min	35.7 min	41.3 min	8 min
	5 L	—	—	—	—	—
	V	35 min	70 min	83.2 min	96.3 min	28 min
	5 R	—	—	—	—	—
	10 R	15 min	30 min	35.7 min	41.3 min	8 min
	20 R	—	10 min	11.9 min	13.8 min	4 min
H	20 L	7 min	—	—	—	—
	10 L	15 min	40 min	47.5 min	55 min	14 min
	5 L	40 min	80 min	95 min	110 min	36 min
	V	40 min	80 min	95 min	110 min	40 min
	5 R	40 min	80 min	95 min	110 min	36 min
	10 R	15 min	40 min	47.5 min	55 min	14 min
	20 R	7 min	—	—	—	—
5 D	20 L	—	10 min	11.9 min	13.8 min	4 min
	10 L	15 min	30 min	35.7 min	41.3 min	8 min
	5 L	—	—	—	—	—
	V	35 min	70 min	83.2 min	96.3 min	28 min
	5R	—	—	—	—	—
	10 R	15 min	30 min	35.7 min	41.3 min	8 min
	20 R	—	10 min	11.9 min	13.8 min	4 min
10 D	10 L —	—	—	—	—	—
	5 L	—	16 min	19 min	22 min	8 min
	V	—	—	—	—	—
	5 R	—	16 min	19 min	22 min	8 min
	10 R	—	—	—	—	—
Max. luminous intensity		300max	300max	380max	420max	100max
Min. luminous Intensity within defined angle range		—	—	—	—	0.3 min Vertical range: Within 15° Lateral range: Within 45°

- Remarks
1. When a tail lamp is commonly used as a stop lamp in the same optical system, the luminous intensity during the stop lamp is in operation shall not be less than three times the luminous intensity of the tail lamp at any points on or above H, except that such intensity at V-V, H-5L, H-5R and 5U-V shall be 5 times that of the tail lamp.
 2. The maximum luminous intensity indicates the value within the area from 10 U to 10 D and from 20 L to 20 R. (Only for Korea specification)
 3. The values in Table 4 apply to the luminous intensity of stop lamps of two-lamp and three-lamp systems when the distance between filament centers of two adjacent lamps is not exceeding 560 mm for two-lamp system or 405 mm for three-lamp system. When the distance between filament centers is exceeding the above stated values, the values for single-lamp system given in Table 4 shall apply to each light source.