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KES

Main Fuse Box

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Appendix

Remark



1. Scope of Application

The standard specifies the main fuse box for automobiles.

2. Purpose

The standard aims at securing proper quality by standardizing the specifications.

3. Report of Evaluation Results

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

4. Definition of Terminology

(1) Main fuse box

A box containing slow-blow fuses that protect harnesses in case of short circuit

(2) Slow-blow fuses

A large-capacity cartridge-type fuse used for power source such as a battery and alternator.

5. Specification Indicated in Drawings

(1) Number and capacity of the fuses, and fuse warning symbol

(2) Connector

(3) External dimensions

(4) Material of box(body, bracket, cover)

(5) Material of terminal

(6) Material of distribution panel board

(7) Size of nut, washer and hexagon bolt

6. Evaluation Standard

The evaluation standard of main fuse box shall conform to Table 1.

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

Evaluation Item			Evaluation Method	
Du- ra- bi- li- ty	Vibration resistance	First evaluation	7.5.1	First evaluation method
	• Operating force of slider	Second evaluation (Evaluation item tested after evaluating the vibration resistance)	• 7.3.1	Second evaluation method
	•• Noise		•• 7.3.7	Third evaluation method
		Third evaluation (Evaluation item tested after evaluating the operating force)		

Remark 2. The quality rank shall be represented by A, AR, B or C.
The definitions shall conform to KMS Q 410001(Determination and Procedure of Quality Ranking).

Table 1

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Appearance	External appearance of plastic parts	No deformation, flaw or burr. No crack, dent, shrinkage, welding mark or decoloration that lowers commercial value of products. When it is hard to judge, examine by received sample.	B	Visual
	External dimensions	To meet dimensional tolerance specified in approval drawings.	B	Measure dimension of each part with slide calipers and micrometer projector
	Change in labeling position	To conform to approval drawings.	C	Measure with slide calipers
	External appearance of label portion	No blurring or stain. When it is hard to judge, examine by received sample.	C	Visual
	Detachability of label	No peeling off	C	Using cellophane tape of 9mm or more in width, peel twice at a speed of 2-10m/minute.
Strength	Impact resistance	No break No coming-off of fuse and cover	A	7.2.1

Table 1 (Continued)

Evaluation Item		Evaluation Standard		Quality Rank	Evaluation Method
Strength	Insertion force of cover	8 kgf {78.4 N} max.		C	Using push-pull gauge, measure insertion force by pressing center of cover at 20-200mm/m speed
	Removal force of cover	Attachment: 10 kgf {98 N} max. Removal: 15 kgf {147 N} min.		C	7.2.2
	Sticking force of cover	5 kgf {47 N} min.		B	7.2.3
	Strength after repeated insertion and removal				7.2.4
	• Insertion force of cover	8 kgf {78.4 N} max.		C	
	• Removal force of cover	10 kgf {98 N} max.		C	• 7.2.2
	• Sticking force of cover	5 kgf {49 N} min.		B	• 7.2.3
	Insertion force of fuse	8 kgf {78.4 N} max.		C	Measure with push-pull gauge
	Removal force of fuse	Upper side 1.2 kgf {11.76 N} Lower side 8 kgf {78.4 N}		C	Measure with push-pull gauge
	Sticking force of terminal	Vertical direction	8 kgf {78.4 N} max.	A	7.25
		Direction inclined 30° from horizon	No loosening of terminal		

Table 1 (Continued)

Evaluation Item		Evaluation Standard		Quality Rank	Evaluation Method
Strength	Arrangement of connector	No hindering factor. When fastening the connector, fastening sound shall be heard		C	Insert connector and evaluate
	Insertion force of connector	1P	6 kgf {58.8 N} max.	C	7.2.6
		2P	9 kgf {88.2 N} max.		
		3P	12 kgf {117.6 N} max.		
	Removal force of connector	1P	3-6 kgf {29.4 - 58.8 N}	C	7.2.7
		2P	3-9 kgf {29.4 - 88.2 N}		
		3P	3-12 kgf {29.4 - 117.6 N}		
	Wrong connection of connector	No wrong connection		B	7.2.8
	Tightening torque of bolt and nut	No break until 110 kgf · cm		A	7.2.9
	Opening and closing force of side cover	Closing force: 5 kgf {49 N max.} max. Opening force: 2-6 kgf {19.6 - 58.8N}		C	7.2.10
	Durability of side cover hinge part	No crack in hinge part		C	7.2.11
	Strength of box fixed part	No deformation of fixing strength		B	7.2.12
	Connector lock strength	Shaft direction	10 kgf {98 N} min.	A	7.2.13
		Direction inclined 30° from horizon	No removal nor break of locking device		
	Loosening torque of bolt and nut	No break		B	7.2.14

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Noise	Noise	- No noise and loosening inside box - No loosening between box and cover	C	Shake with hand in front/rear, left/right, up/down directions
Electrical characteristics	Insulation resistance	100Ω or more at initial stage	B	7.3
	Voltage resistance	No accident such as break of insulator and surface discharge	B	7.4
	Voltage drop	15 mV/A or less at initial stage	A	7.5
	Temperature rise	50℃ or less	A	7.6
	Charging current	No ignition No rust of box	A	7.7
	• Voltage drop	25 mV/A or less	A	• 7.5
	Excessive current	No ignition No rust of box	A	7.8
	• Voltage drop	25 mV/A or less	A	• 7.5
Environmental resistance	Heat resistance	No loosening that causes coming-off of cover	C	7.9.1
	• External appearance of plastic parts	No harmful deformation No discoloration that lowers commercial value of products When it is hard to judge, examine by received sample	B	• Visual
	• External appearance of label portion	No blurring nor crushing When it is hard to judge, examine by received sample	C	• Visual
	• Detachability of label	No peeling off	C	

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Envir- onmen- tal resis- tance	• Noise	No noise and loosening inside box. No loosening between box and cover. In case of using through connector, there shall be no abnormal noise when connecting specified harnesses.	C	
	• Voltage drop	25 mV/A or less	A	• 7.5
	Cold resistance			7.9.2
	• External appearance of plastic parts	No harmful deformation No discoloration that lowers commercial value of products When it is hard to judge, examine by received sample	B	• Visual
	• External appearance of label portion	No blurring nor crushing When it is hard to judge, examine by received sample	C	• Visual
	• Detachability	No peeling-off	C	
	• Noise	No noise and loosening inside box. No loosening between box and cover. In case of using through connector, there shall be no abnormal noise when connecting specified harnesses.	C	
	• Voltage drop	25 mV/A or less	A	• 7.5
	Temperature cycle resistance			7.9.3
	• External appearance of plastic parts	No harmful deformation No discoloration that lowers commercial value of products When it is hard to judge, examine by received sample	B	• Visual