

Fuel Pump Assembly

KES

KES D-A302

Contents

1. Scope of Application
2. Purpose
3. Report of Evaluation Result
4. Definition of Terminology
5. Specification Indicated in Drawings
6. Evaluation Standard
7. Evaluation Method
8. Alteration of Specifications
9. Indication Method on Drawings
10. Quoted Standard

Appendix

Remark



1. Scope of Application

This standard specifies the EGI in-tank type fuel pump assembly for automobiles (hereinafter referred to as the "fuel pump Assy")

2. Purpose

The standard aims at securing proper quality by standardizing specifications.

Remark: This standard and drawings communicate together our requirements.

3. Report of Evaluation Result

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) Fuel Pump Assy

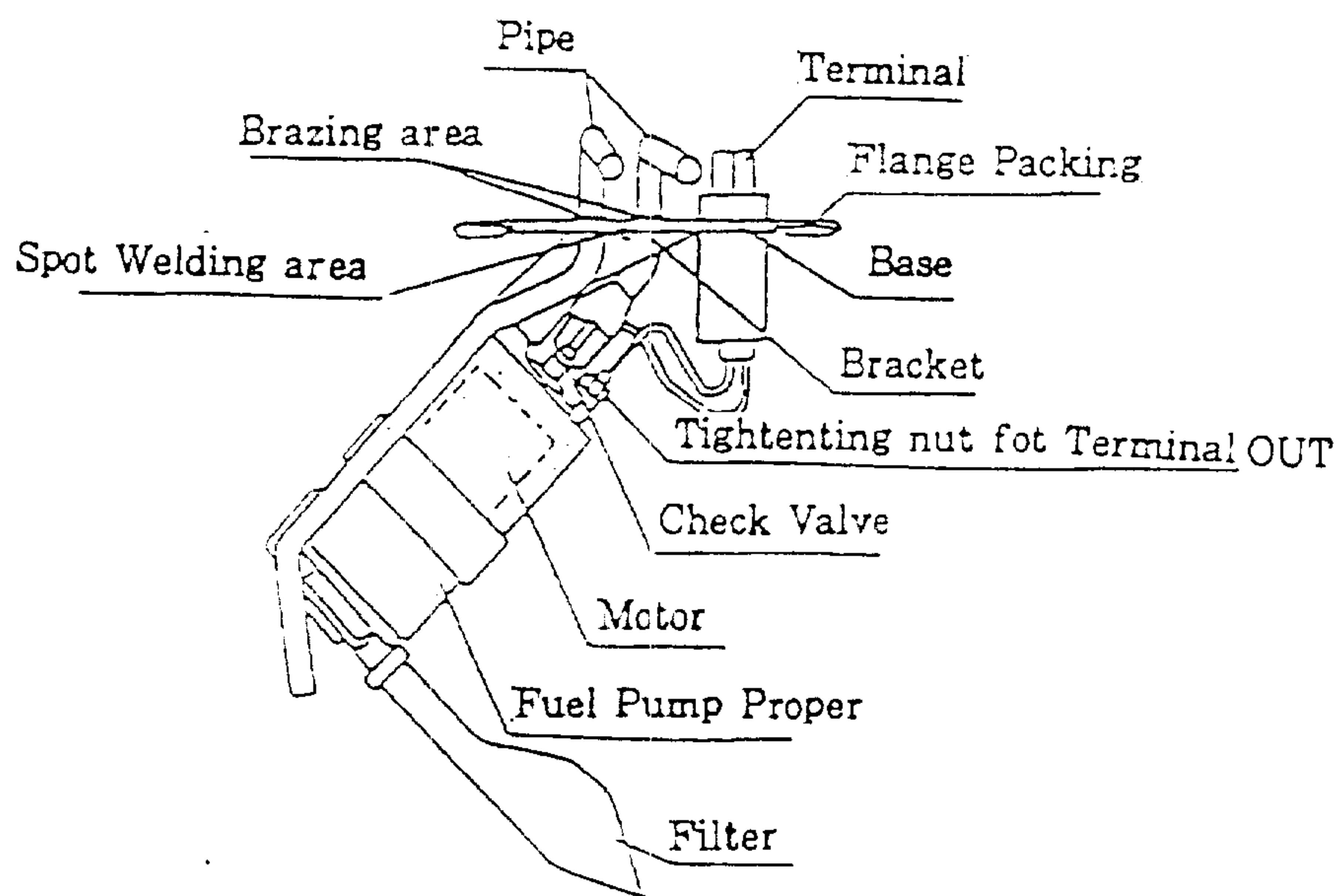


Fig. 1

- (2) Symbol
- ① P : Discharge pressure of fuel pump
 - ② Q : Discharge quantity of fuel pump
 - ③ V : Applied voltage of fuel pump
 - ④ T : Ambient temperature of fuel pump(fuel temperature)

5. Specification Indicated in Drawings

- (1) P-Q characteristics
- (2) V-Q characteristics
- (3) T-Q characteristics
- (4) Working current
- (5) Fuel static pressure
- (6) Tightening torque

6. Evaluation Standard

The evaluation standard of the fuel pump Assy 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	Third evaluation (Evaluation item tested after evaluating the operating force)	•• 7.3.7	Third evaluation method

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
Per- for- mance	P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	V-Q characteristics		A	7.2.2
	T-Q characteristics		A	7.2.3
	Working current		B	7.2.4
	Fuel static pressure		A	7.2.5
	Tightening torque		A	7.2.6
	Insulation resistance	1.0 MΩ min.	B	7.2.7
	Airtightness	No leakage in each terminal caulking, brazing part, spot welding part and flange packing part.	A	7.2.8
	Check valve sealing	0.05 kgf/cm ² · min {4.9 kPa/min} Max.	B	7.2.9
Stren- gth	Terminal, tensile strength	-	A	7.3.1
	· P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	· Insulation resistance	1.0 MΩ min.	B	7.2.7
	Pipe welding strength	-	A	7.3.2
	· Airtightness	(1) No leakage in each terminal caulking, brazing part, spot welding part and flange packing part. (2) Damage in pipe except brazing part are allowed.	A	7.2.8
	Pressure resistance of check valve	-	A	7.3.3
Envir- onmen- tal resis- tance	· P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	Exposure to high temperature	-	A	7.4.1
	· V-Q characteristics	Shall conform to the specification in drawings	A	7.2.2

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Envir- onmen- tal resis- tance	• Working current	Shall conform to the specification in drawings	B	7.2.4
	• Fuel static pressure	Shall conform to the specification in drawings	A	7.2.5
	• Insulation resistance	1.0 MΩ min.	B	7.2.7
	• Airtightness	No leakage in each terminal caulking, brazing part, spot welding part and flange packing part.	A	7.2.8
	Exposure to low temperature	-	A	7.4.2
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• V-Q characteristics		A	7.2.2
	• Working current		B	7.2.4
	• Fuel static pressure		A	7.2.5
	• Insulation resistance	1.0 MΩ min.	B	7.2.7
	• Airtightness	No leakage in each terminal caulking, brazing part, spot welding part and flange packing part.	A	7.2.8
	Temperature cycle	-	A	7.4.3
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• V-Q characteristics		A	7.2.2
	• Working current		B	7.2.4
	• Fuel static pressure		A	7.2.5
	• Insulation resistance	1.0 MΩ min.	B	7.2.7
	• Airtightness	No leakage in each terminal caulking, brazing part, spot welding part and flange packing part.	A	7.2.8
	Salt water spray	-	A	7.4.4
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• Insulation resistance	1.0 MΩ min.	B	7.2.7
	• Airtightness	No leakage in each terminal caulking, brazing part, spot welding part and flange packing part.	A	7.2.8

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance	Vibration resistance	-	A	7.4.5
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• V-Q characteristics		A	7.2.2
	• Working current		B	7.2.4
	• Fuel static pressure	1.0 MΩ min.	A	7.2.5
	• Insulation resistance		B	7.2.7
	• Airtightness		A	7.2.8
Durability	High temperature working durability	-	A	7.5.1
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• V-Q characteristics		A	7.2.2
	• Working current		B	7.2.4
	• Fuel static pressure		A	7.2.5
	• Insulation resistance		B	7.2.7
	Low temperature working durability	-	A	7.5.2
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• V-Q characteristics		A	7.2.2
	• Working current		B	7.2.4
	• Fuel static pressure		A	7.2.5
	• Insulation resistance		B	7.2.7
	Working durability	-	A	7.5.3
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• V-Q characteristics	Shall conform to the specification in drawings	A	7.2.2

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Durability	• Working current	Shall conform to the specification in drawings	B	7.2.4
	• Fuel static pressure	Shall conform to the specification in drawings	A	7.2.5
	• Insulation resistance	1.0 MΩ min.	B	7.2.7
Special environmental resistance	Dry pumping	-	A	7.5.1
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• V-Q characteristics		A	7.2.2
	• Working current		B	7.2.4
	• Fuel static pressure		A	7.2.5
	• Insulation resistance	1.0 MΩ min.	B	7.2.7
	Motor lock	No explosion caused by propagation of flame to outside of fuel pump assy	B	7.6.2
	• Voltage resistance-1	No explosion caused by propagation of flame to outside of fuel pump assy	A	• 7.6.3
	• P-Q characteristics	Shall conform to the specification in drawings	A	7.2.1
	• V-Q characteristics		A	7.2.2
	• Working current		B	7.2.4
	• Fuel static pressure		A	7.2.5
	• Insulation resistance	1.0 MΩ min.	B	7.2.7
	• Voltage resistance-2	No explosion caused by propagation of flame to outside of fuel pump assy	A	• 7.6.3

7. Evaluation Method

7.1 Common evaluation condition

7.1.1 Standard atmospheric condition for testing

Unless otherwise specified, the standard atmospheric condition shall be a standard temperature condition of 20℃, class 15($20 \pm 15^\circ\text{C}$) and a standard humidity condition of 65%, class 20($65 \pm 20\%$) specified in KS A 0006(Standard Atmospheric Conditions for Testing).

7.1.2 Fuel used

Unless otherwise specified, unleaded regular gasoline shall be used.

7.1.3 Evaluation

The fuel pump assy shall be used in the evaluation.

7.2 Performance

7.2.1 P-Q characteristics

Apply the voltage of $12 \pm 0.1\text{V}$, set the discharge pressure of fuel pump at ① $2.55 \pm 0.1 \text{ kgf/cm}^2$ ($250 \pm 9.8 \text{ kPa}$) and ② $3.1 \pm 0.1 \text{ kgf/cm}^2$ ($304 \pm 9.8 \text{ kPa}$), and measure the discharge quantity for each case.

7.2.2 V-Q characteristics

Set the applied voltage to fuel pump to ① $8 \pm 0.1\text{V}$ and ② $12 \pm 0.1\text{V}$ at the discharge pressure of $2.55 \pm 0.1 \text{ kgf/cm}^2$ ($250 \pm 9.8 \text{ kPa}$), and measured the discharge quantity for each case.

7.2.3 T-Q characteristics

- (1) With applying voltage of $12 \pm 0.1\text{V}$ and the discharge pressure of $2.55 \pm 0.1 \text{ kgf/cm}^2$ ($250 \pm 9.8 \text{ kPa}$), set the ambient temperature of fuel pump(fuel temperature) at ① $-30^\circ\text{C} \pm 5^\circ\text{C}$ and ② $60^\circ\text{C} \pm 5^\circ\text{C}$, and measure the discharge quantity for each case.
- (2) After leaving the test piece at each temperature for 1 hour or more, and measure.
- (3) Perform the evaluation when there is no vapor.

7.2.4 Working current

Apply the voltage of $12 \pm 0.1\text{V}$ at the discharge pressure of $2.55 \pm 0.1 \text{ kgf/cm}^2$ ($250 \pm 9.8 \text{ kPa}$), measure the current in the fuel pump.