

KES

High Tension Cord Assembly

KES D-A823

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1. Purpose

This standard aims at securing proper quality by standardizing specification.

Remark : This standard and drawings communicate together our requirements.

2. Scope of Application

This standard specifies the high tension cord for automobiles(hereinafter referred to as the "HT cord").

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) Performance

The quantitative capacity satisfying the purpose of use is expressed by such factors as:

- ① Resistance
- ② Voltage resistance
- ③ Electrostatic capacity

(2) Function

Qualitative capacity satisfying the purpose of use.

(3) Normal-working temperature range

Temperature at which the performances specified in the drawing is guaranteed.

(4) Storage temperature range

Ambient temperature range at which HT cord is installed.

However, when the HT cord left at the storage temperature range is cooled or heated to the normal-working range, it shall satisfy the performances indicated in the drawing.

(5) Abbreviation

T_1 : Minimum value of storage temperature

T_2 : Minimum value of normal-working temperature

T_3 : Maximum value of normal-working temperature

T_4 : Maximum value of storage temperature

T_5 : Ambient temperature in engine room during the normal-working specified in the drawing

L : Length of HT cord specified in the drawing

(6) Smoke

Generation of smoke with the amount of (1) or more.

Cigarette's smoke is the amount of smoke generated when 1 cigarette has been burnt.

(7) Ignition

Condition that HT cord flames out.

(8) Body cap cord

Plug cap with a rain cover to prevent water from penetrating into the plug hole on the engine head cover.

5. Specifications Indicated in Drawings

(1) Normal-working temperature range : T_2 , T_3

(2) Storage temperature range : T_1 , T_4

(3) Ambient temperature in engine room during engine normal-working : T_5

(4) Voltage applied to test voltage resistance : $V(KV)$

(5) Electrostatic capacity : $C(pF)$

(6) Length of HT cord : $L(mm)$

(7) Shape of HT cord

6. Evaluation Standard

The evaluation standard of the HT cord 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 Q410001(Determination and Procedure of Quality Ranking).

Table 1

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
External appearance and quality	Burr and flaws Crack Discoloration Deformation	To be within the limit of minimum tolerances	A	Visual
Performance	Resistance	$L(16 \pm 6) \Omega$	AR	7.2.1
	Voltage resistance	Continuous spark at 3 needle GAP	A	7.2.2
	Electrostatic capacity	To satisfy the standard specified in the drawing		7.2.3

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method	
Environmental Durability	Heat resistance	--	A	7.3.1	
	• Crack	No crack	A	• Visual	
	• Discoloration	No discoloration nor deformation which deteriorates function	B		
	• Deformation				
	•• Resistance	Change in initial resistance value shall be within 100%	AR	•• 7.2.1	
	•• Voltage resistance	Continuous spark of 3 needle GAP	A	•• 7.2.2	
	•• Electrostatic capacity	To satisfy the standard specified in the drawing		•• 7.2.3	
	Cold resistance	--	AR	7.3.2	
	• Crack	No crack.	A	• Visual	
	• Discoloration	No discoloration nor deformation which deteriorates function	B		
	• Deformation				
	•• Resistance	Change in initial resistance value shall be within 100%	AR	•• 7.2.1	
	•• Voltage resistance	Continuous spark of 3 needle GAP	A	•• 7.2.2	
	•• Electrostatic capacity	To satisfy the standard specified in the drawing		•• 7.2.3	
	Thermal shock durability	--	AR	7.3.3	
	• Crack	No crack.	A	• Visual	
	• Discoloration	No discoloration nor deformation which deteriorates function	B		
	• Deformation				
	•• Resistance	Change in initial resistance value shall be within 100%	AR	•• 7.2.1	

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental Durability	..Voltage resistance	Continuous spark of 3 needle GAP	A	..7.2.2
	..Electrostatic capacity	To satisfy the standard specified in the drawing.		..7.2.3
	Chemical resistance	--	AR	7.3.4
	• Crack	No crack	A	Visual
	• Deformation	No deformation which deteriorates function	B	
	..Voltage resistance	Continuous spark of 3 needle GAP	A	..7.2.2
	..Electrostatic capacity	To satisfy the standard specified in the drawing.		..7.2.3
	Ozone resistance	--	A	7.3.5
	• Crack	No crack.	A	Visual
	• Discoloration	No discoloration nor deformation which deteriorates function	B	
	• Deformation			
	..Voltage resistance	Continuous spark of 3 needle GAP	A	..7.2.2
	..Electrostatic capacity	To satisfy the standard specified in the drawing.		..7.2.3
	Corona durability	--	A	7.3.6
	• Crack	No crack.	A	Visual
	• Discoloration	No discoloration nor deformation which deteriorates function	B	
	• Deformation			
	..Resistance	Change in initial resistance value shall be within 100%	AR	..7.2.1

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental Durability	••Voltage resistance	Continuous spark of 3 needle GAP	A	••7.2.2
	••Electrostatic capacity	To satisfy the standard specified in the drawing.		••7.2.3
	Oil resistance	--	A	7.3.7
	• Crack	No crack.	A	Visual
	• Discoloration	No discoloration nor deformation which deteriorates function	B	
	• Deformation			
	••Voltage resistance	Continuous spark of 3 needle GAP	A	••7.2.2
	••Electrostatic capacity	To satisfy the standard specified in the drawing.		••7.2.3
	Combined environmental resistance	--	AR	7.3.8
	• Smoke and ignition	No smoke nor ignition	A	Visual
	• Crack	No crack.	A	
	• Deformation	No deformation which deteriorates function	B	
	••Resistance	Change in initial resistance value shall be within 100%	AR	••7.2.1
	••Voltage resistance	Continuous spark of 3 needle GAP	A	••7.2.2
	••Electrostatic capacity	To satisfy the standard specified in the drawing.	A	••7.2.3
Durability	High temperature working durability	--	AR	7.4.1
	• Crack	No crack.	A	Visual

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Durability	• Discoloration	No discoloration nor deformation which deteriorates function	B	
	• Deformation			
	•• Resistance	Change in initial resistance value shall be within 100%	AR	•• 7.2.1
	•• Voltage resistance	Continuous spark of 3 needle GAP	A	•• 7.2.2
	•• Electrostatic capacity	To satisfy the standard specified in the drawing.		•• 7.2.3
Strength	Tensile strength	--	A	7.5.1
	• Resistance	L (16±6) Ω	A	• 7.2.1
	Separating force between HT cord and terminal	(1) Spark plug terminal : 8kgf(78.4N) or more (2) Ignition coil terminal : 7kgf(68.6N) or more (3) Distributor terminal : 7kgf(68.6N) or more	A	7.5.2
	Separating force between HT cord and cap	(1) Spark plug terminal : 10kgf(98.0N) or more (2) Ignition coil terminal : 8kgf(78.4N) or more (3) Distributor terminal : 8kgf(78.4N) or more	A	7.5.3
	Inserting and removal force of terminal	Inserting force of spark plug, ignition coil, distributor terminal : 8kgf(78.4N) or less removal force : 1.5~7kgf(14.7N~68.6N)	A	7.5.4
	Rapid tensile load	--	A	7.5.5
	• Resistance	L(16±6) Ω		• 7.2.1

7. Evaluation Method

7.1 Common evaluation condition

7.1.1 Standard atmospheric conditions for testing

Unless otherwise specified, the standard atmospheric condition shall be a standard temperature condition of 20°C, class 15(20 ± 15°C) and a standard humidity condition of 65%(class 20: 65 ± 20%) specified in KS A 0006(Standard atmospheric conditions for testing).

7.1.2 Temperature tolerance

Except the standard temperature indicated in drawing, testing temperature tolerance shall be ±5°C when the testing temperature is not specified.

7.1.3 Distributor, ignition coil, spark plug for testing shall be approved by KIA.

7.2 Performance

7.2.1 Resistance

Measure the resistance between terminals of both ends of the HT cord with wheatstone bridge (electric resistance measuring equipment) or ohmmeter(electric resistance meter) having the accuracy of 1% or less. The measuring voltage shall be 12V or less.

7.2.2 Voltage resistance

- (1) Apply the voltage specified in drawing to HT cord for 5 min in salt water of 5% salt contraction and at the normal temperature as shown in Fig 1. (Circuit diagram : Refer to Fig. 1.)
- (2) While applying the voltage, evaluate for the condition of spark among 3 wires.

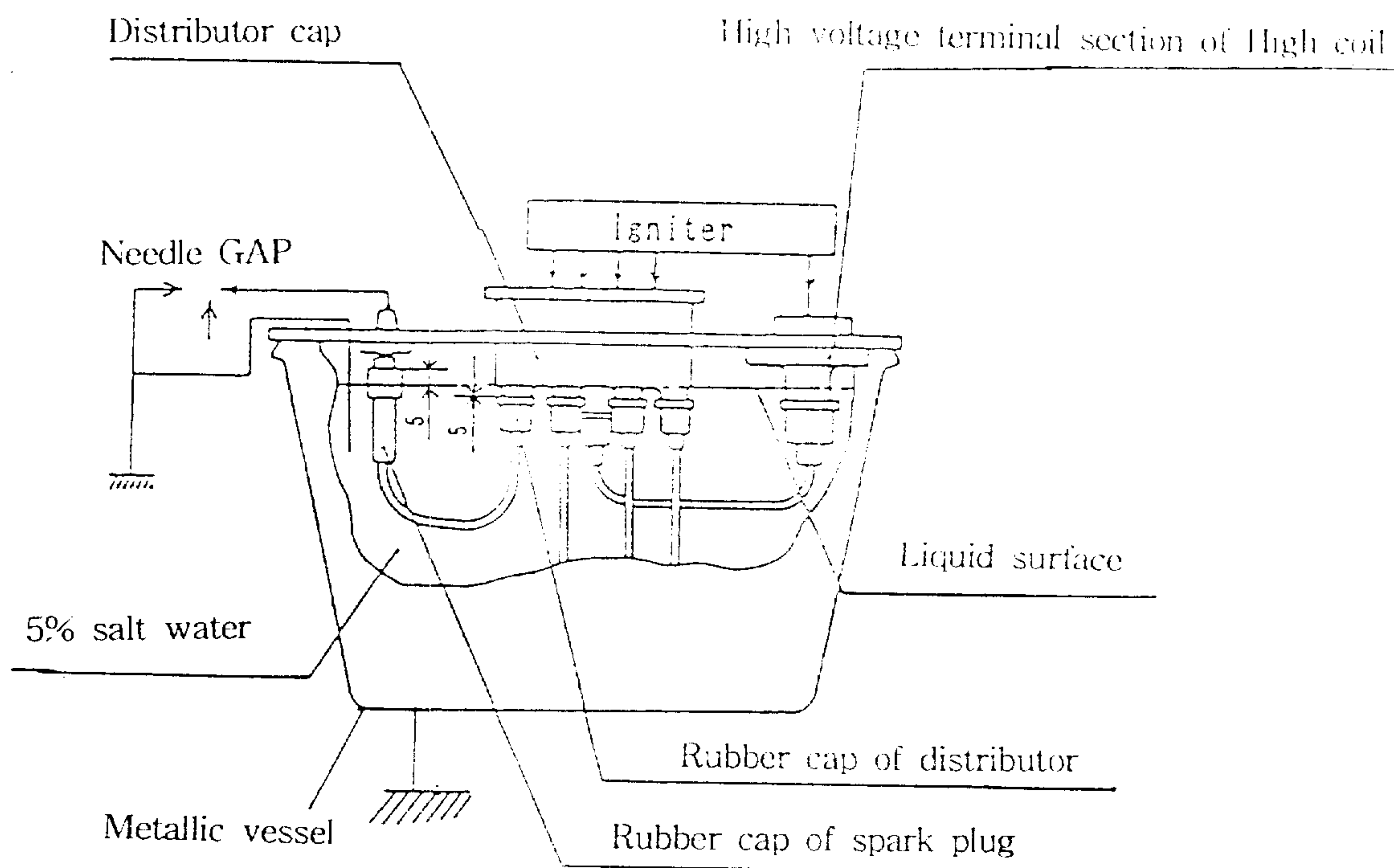


Fig. 1

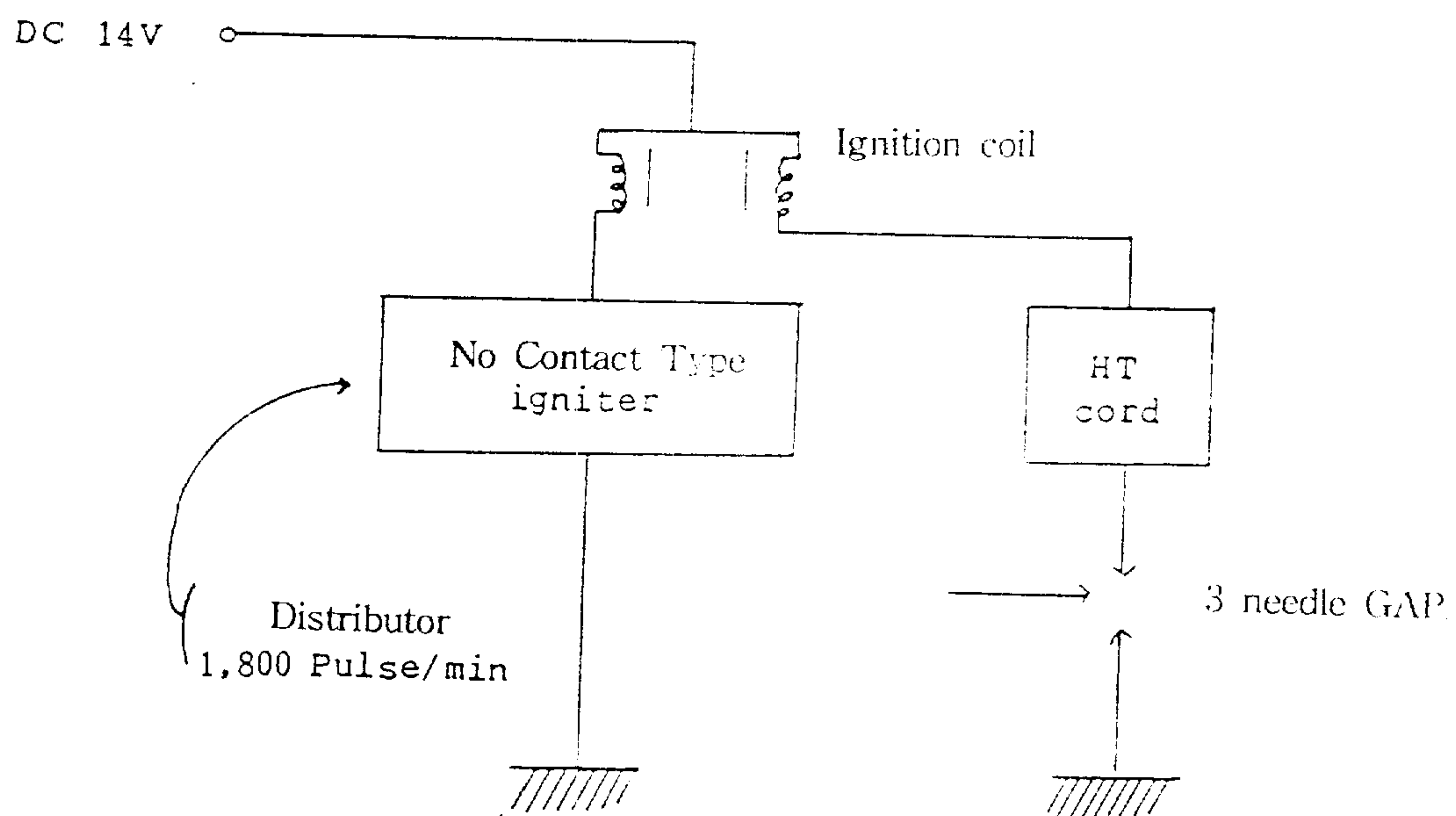


Fig. 2