

KES

Ignition Coil

KES D-A826

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Remark



1. Scope of Application

This standard specifies ignition coil for automobiles(hereinafter referred to as "IG").

2. Purpose

This standard aims at securing proper quality by standardizing specifications.

Remark: This standard and specification drawings communicate 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) Performance Guaranteed temperature range

Ambient temperature range that satisfies the performance of the ignition coil specified in the drawing.

(2) Storage Guaranteed temperature range

Ambient temperature range in which the ignition coil shall be installed. When the ignition coil is moved from the storage guaranteed temperature range to the performance guaranteed temperature range, the performance specified in the drawing shall be satisfied.

(3) Fuming

Generation of one or more cigarette's smoke out of the ignition coil.

(4) Ignition

Flame generated at the ignition coil

(5) Abbreviations

T₁ : Minimum storage guaranteed temperature

T₂ : Minimum performance guaranteed temperature

T₃ : Maximum performance guaranteed temperature

T₄ : Maximum storage guaranteed temperature

(6) Primary breaking current

The current value at the moment the primary current is broken after the specified time since applying the current to the primary coil of the ignition coil.

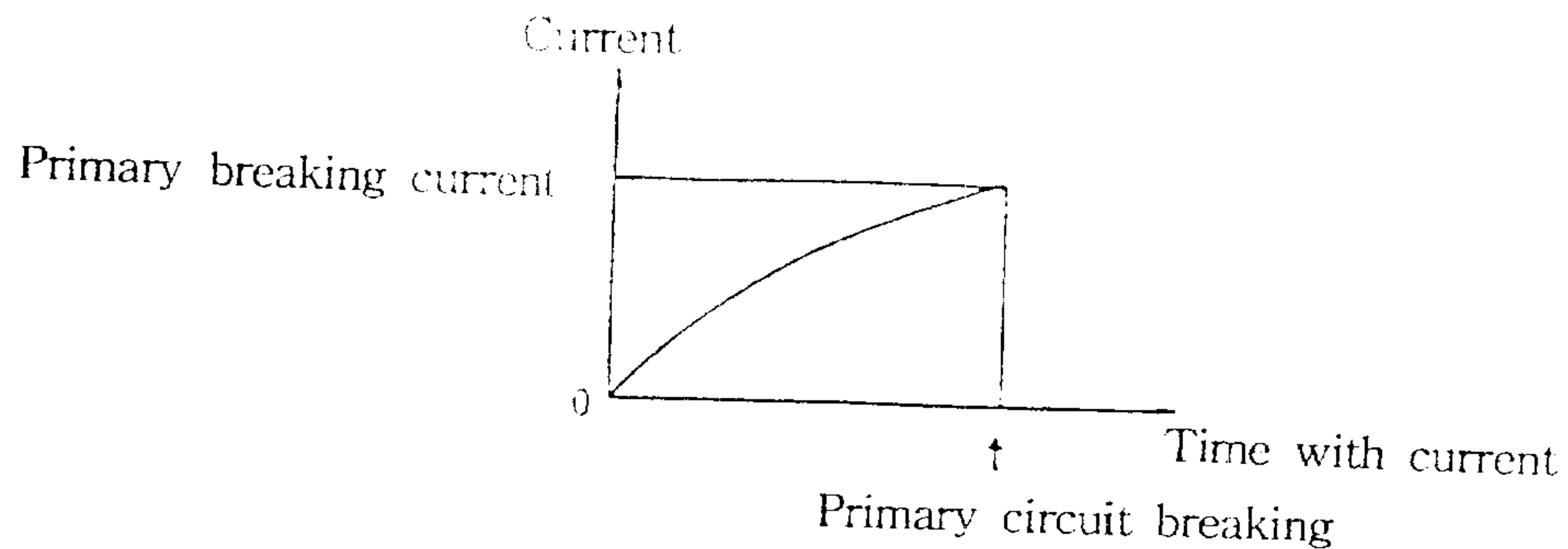


Fig. 1

(7) Oscillator

Continuous false signal generator to turn ON and OFF the power transistor Q1 at the primary circuit.

Table 1

Property Item	Symbol	Condition	Standard Value	Remark
Collector current	I_c	rating 25°C	6A or more	
Saturated voltage between collector and emitter	V_{ces}	rating 25°C $I_c=6A$, $I_B=50mA$	1.5V or less	
Collector breaking current	I_{ceo}	25°C $V_{ced}=400V$ $I_B=0$	10V μ A or less	
Working lag time	T_d	25°C $I_c=3A$	15 - 40 μ s	Measurement Method shall be specified Fig. 2 and 3.

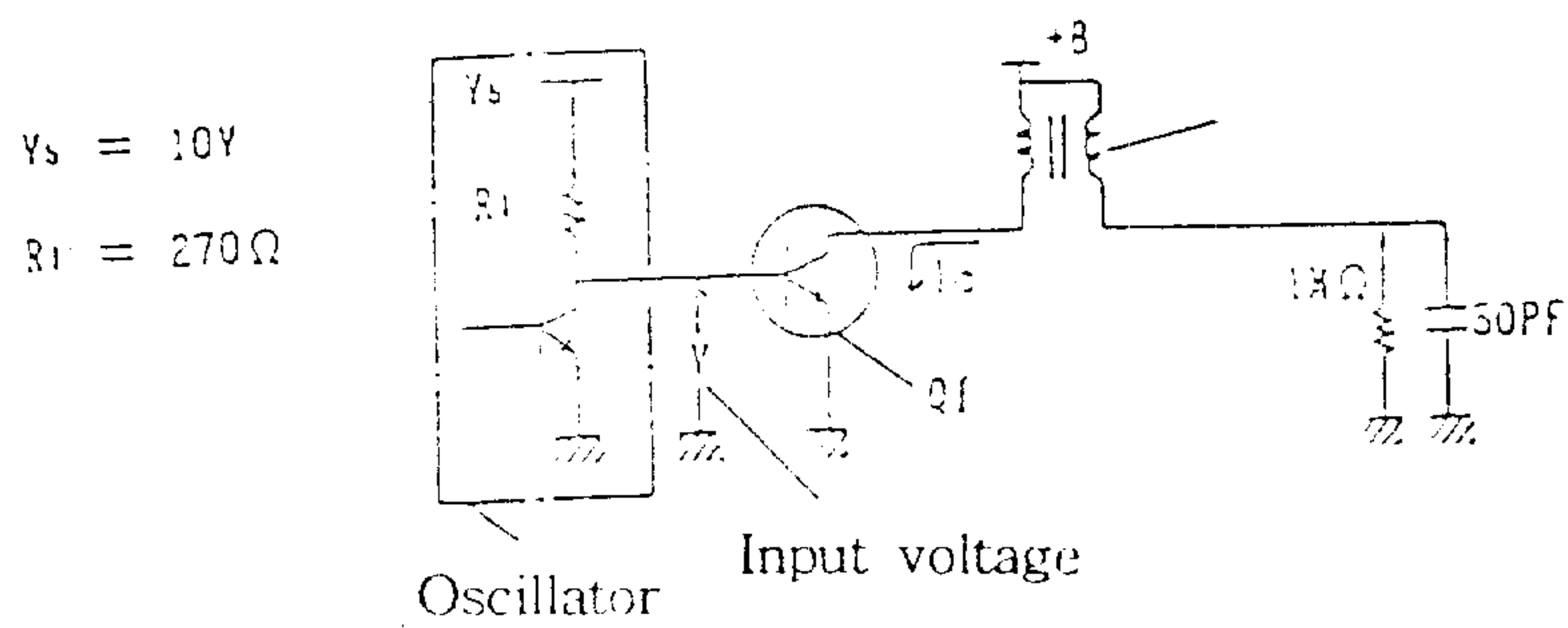


Fig. 2 Measurement of working lag time

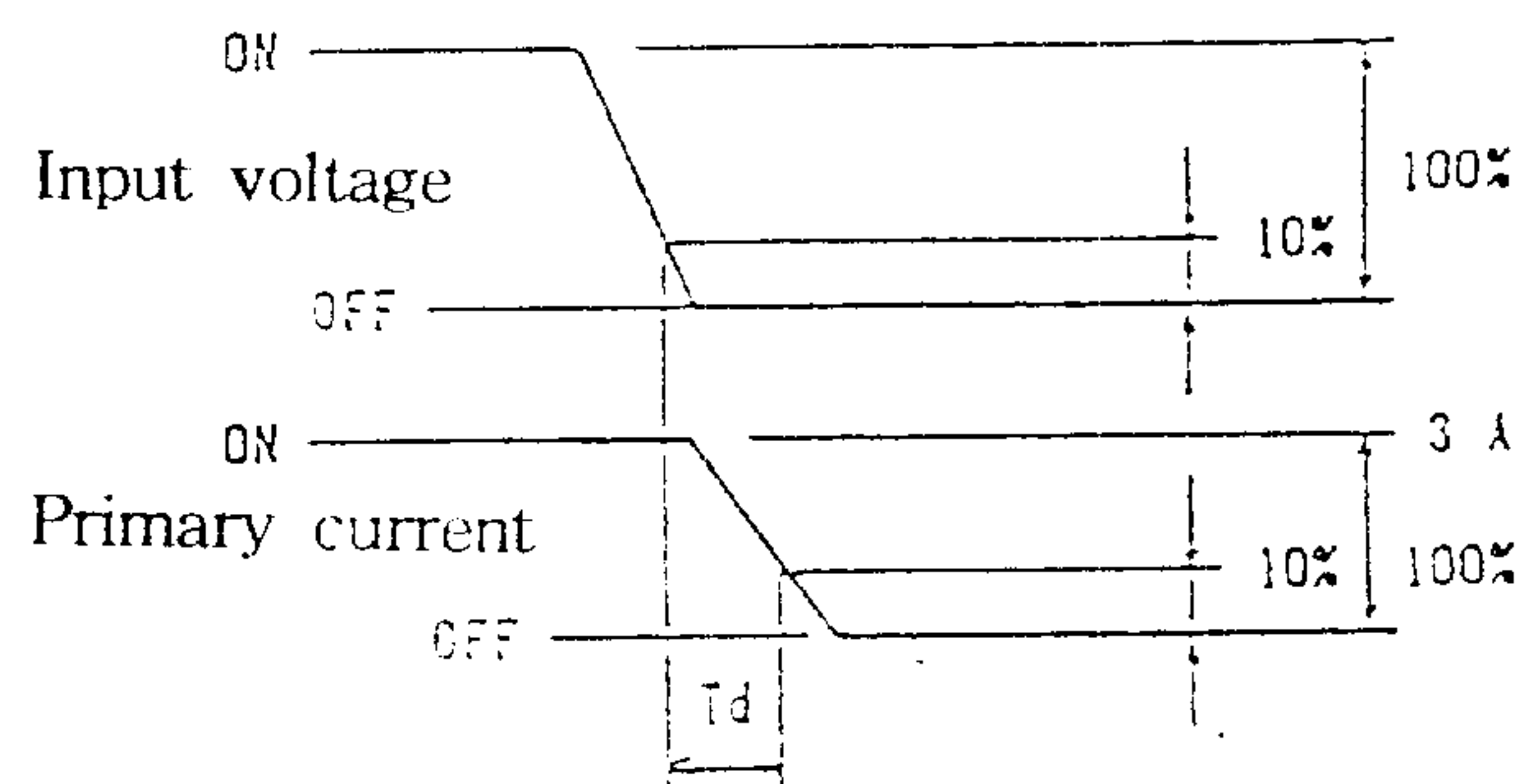


Fig. 3

In order to obtain the primary current of 3A, adjust the closed circuit rate, or frequency.

5. Specifications Indicated in Drawings

- (1) Storage Guaranteed Temperature Range : T_1 , T_4
- (2) Performance Guaranteed Temperature Range : T_2 , T_3
- (3) Primary Current Build-up Characteristic : (t_1, I_1) , (t_2, I_2) , (t_3, I_3)
- (4) Secondary Output Voltage : (I_{c1}, V_{21}) , (I_{c2}, V_{22})
- (5) Load at the secondary side of the ignition coil

- (6) Second Energy : (I_{c1} , E_1), (I_{c2} , E_2)
- (7) Primary Voltage Waveform : τ
- (8) Built in Resistance at the Output Terminal for tachometer
- (9) Classified Symbol of Vibration Condition
- (10) Vibration Direction
- (11) Primary Resistance : (R_1)
- (12) Water Resistance t_1 , t_4 (conform to Table 4, unless otherwise specified)
- (13) Fire Resistance Rank of Materials for High pressure tower
(Select from V - 0, V - 1, V - 2, HB)

6. Evaluation Standard

The evaluation standard of the ignition coil shall conform to Table 1.

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

Example :

Evaluation Item				Evaluation Method	
Durability	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 Q410001 (Determination and Procedure of Quality Ranking)

Table 2

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
External appearance	Rust and Corrosion of metal	It shall satisfy the requirements of acceptable sample.	A	Visual
	Nick and flaw of the resin			
	Discoloration of resin			
	Crack			
	Deformation			
Performance	Primary resistance(R1)	It shall satisfy the requirements specified in the drawing.	A	7.2.1
	Primary current building-up characteristics (t_1, I_1), (t_2, I_2), (t_3, I_3)		A	7.2.2
	Secondary output voltage (I_{c1}, V_{21}), (I_{c2}, V_{21})		A	7.2.3
	Secondary energy (I_{c1}, E_1), (I_{c2}, E_2)		A	7.2.4
	Primary voltage waveform τ		A	7.2.5
	Insulation resistance	10 M or more	A	7.2.6
	Dielectric strength	Insulation break-down, flash-over, surface discharge, etc. shall not occur.	A	7.2.7
	• Secondary output voltage (I_{c1}, V_{21}), (I_{c2}, V_{22})	It shall satisfy the requirements specified in the drawing.	A	• 7.2.3
	Built-in resistance of output terminal for tachometer		A	7.2.8

Table 2 (continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Dura- bility	Compoand working durability		A	7.3.1
	• Primary resistance (R1)	It shall satisfy the requirements specified in the drawing.	A	• 7.2.1
	• Primary current building-up characteristics (t_1, I_1), (t_2, I_2), (t_3, I_3)		A	• 7.2.2
	• Secondary output voltage (I_{C1}, V_{21}), (I_{C2}, V_{22})		A	• 7.2.3
	• Primary voltage waveform		A	• 7.2.5
	• Dielectric strength	Insulation break-down, flash-over, discharge, etc. shall not occur.	A	• 7.2.7
	• Secondary output voltage (I_{C1}, V_{21}), (I_{C2}, V_{22})	It shall satisfy the requirements specified within the drawing.	A	• 7.2.3
	• Built-in resistance of output terminal for tachometer		A	• 7.2.8
	Arc resistance	(1) Carbonization shall take 180 seconds or more. (2) Ignition or fuming shall not occur within 180 seconds.	A	7.3.2
	• Crack	It shall satisfy the requirements of acceptable sample.	A	• visual
	• Deformation		A	

Table 2 (continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Strength	Impact resistance	—	A	• 7.4.1
	• Primary resistance (R1)	It shall satisfy the requirements specified in the drawing.	A	• 7.2.1
	• Primary current building-up characteristics (t_1, I_1), (t_2, I_2), (t_3, I_3)		A	• 7.2.2
	• Secondary output voltage (I_{c1}, V_{21}), (I_{c2}, V_{22})		A	• 7.2.3
	• Primary voltage waveform τ		A	• 7.2.5
	• Dielectric strength	Insulation break-down, flash-over, surface discharge, etc. shall not occur.	A	• 7.2.7
	• Secondary output voltage (I_{c1}, V_{21}), (I_{c2}, V_{22})	It shall satisfy the requirements specified in the drawing.	A	• 7.2.3
	• Built-in resistance of output terminal for tachometer		A	• 7.2.8

Table 2 (continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance chemical resistance	High temperature exposure resistance	-	A	7.5.1
	• Crack	It shall satisfy the requirements specified in the sample.	A	• Visual
	• Deformation		A	
	•• Primary resistance (R1)	It shall satisfy the requirements specified in the drawing.	A	••7.2.1
	•• Primary current building-up characteristics (t ₁ , I ₁), (t ₂ , I ₂), (t ₃ , I ₃)		A	••7.2.2
	•• Secondary output voltage (Ic ₁ , V2 ₁), (Ic ₂ , V2 ₂)		A	••7.2.3
	•• Primary voltage waveform τ		A	••7.2.5
	•• Dielectric Strength		A	••7.2.7
	••• Secondary output voltage (Ic ₁ , V2 ₁), (Ic ₂ , V2 ₂)	It shall satisfy the requirements of acceptable sample.	A	•••7.2.3
	•• Built-in resistance of output terminal for revolution tachometer		A	••7.2.8
	Low temperature exposure resistance	-	A	7.5.2
	• Crack	It shall satisfy the requirements of acceptable sample.	A	• Visual inspection
	• Deformation		A	

Table 2 (continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Dura- bility	.. Primary resistance (R1)	It shall satisfy the requirements specified in the drawing.	A	..7.2.1
	.. Primary current building-up characteristics (t_1, I_1), (t_2, I_2), (t_3, I_3)		A	..7.2.2
	.. Secondary output voltage (I_{c1}, V_{21}), (I_{c2}, V_{22})		A	..7.2.3
	.. Primary voltage waveform τ		A	..7.2.5
	.. Dielectric strength		A	..7.2.7
	... Secondary output voltage (I_{c1}, V_{21}), (I_{c2}, V_{22})	It shall satisfy the requirements specified in the drawing.	A	...7.2.3
	.. Built-in resistance of output terminal for tachometer		A	..7.5.8
	Water resistance	-	A	7.5.3
	• Crack	It shall satisfy the requirements of limited sample.	A	• Visual
	• Deformation		A	
	.. Primary resistance (R1)	It shall satisfy the requirements of acceptable sample.	A	..7.2.1
	.. Primary current building-up characteristics (t_1, I_1), (t_2, I_2), (t_3, I_3)		A	..7.2.2

Table 2 (continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance chemical resistance	•• Secondary output voltage (Ic ₁ , V2 ₁), (Ic ₂ , V2 ₂)	It shall satisfy the requirements specified in the drawing.	A	••7.2.3
	•• Primary voltage waveform τ		A	••7.2.5
	•• Dielectric strength		A	••7.2.7
	••• Secondary output voltage (Ic ₁ , V2 ₁), (Ic ₂ , V2 ₂)	It shall satisfy the requirements specified in the drawing.	A	•••7.2.3
	•• Built-in resistance of output terminal for tachometer		A	••7.2.8
	Moisture resistance		A	7.5.4
	• Crack	It shall satisfy the requirements specified in the drawing.	A	• Visual
	• Deformation		A	
	•• Primary resistance (R1)	It shall satisfy the requirements specified in the drawing.	A	••7.2.1
	•• Primary current building-up characteristics (t ₁ , I ₁), (t ₂ , I ₂), (t ₃ , I ₃)		A	••7.2.2
	•• Secondary output voltage (Ic ₁ , V2 ₁), (Ic ₂ , V2 ₂)		A	••7.2.3

Table 2 (continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance chemical resistance	•• Primary voltage waveform τ		A	••7.2.5
	•• Dielectric Strength	Insulation break-down, flash-over, surface discharge, etc. shall not occur.	A	••7.2.7
	••• Secondary output voltage (Ic1, V21), (Ic2, V22)	It shall satisfy the requirements specified in the drawing.	A	•••7.2.3
	•• Built-in resistance of output terminal for tachometer		A	••7.2.8
	Salt water resistance	-	A	7.5.5
	• Crack	It shall satisfy the requirements of acceptable sample.	A	• Visual
	• Deformation		A	
	•• Primary resistance (R1)	It shall satisfy the requirements specified in the drawing.	A	••7.2.1
	•• Primary current building-up characteristics (t ₁ , I ₁), (t ₂ , I ₂), (t ₃ , I ₃)		A	••7.2.2
	•• Secondary output voltage (Ic ₁ , V2 ₁), (Ic ₂ , V2 ₂)		A	••7.2.3
	•• Primary voltage waveform τ		A	••7.2.5
	•• Dielectric Strength		A	••7.2.7

Table 2 (continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance/chemical resistance	--- Secondary output voltage (Ic1, V21), (Ic2, V22)	It shall satisfy the requirements specified in the drawing.	A	---7.2.3
	-- Built-in resistance of output terminal for tachometer		A	--7.2.8
	• Chemical resistance	—	A	7.5.6
	• Crack	It shall satisfy the requirements of limited sample.	A	• Visual
	• Deformation		A	
	-- Primary resistance (R1)	It shall satisfy the requirements specified in the drawing.	A	--7.2.1
	-- Primary current building-up characteristics (t ₁ , I ₁), (t ₂ , I ₂), (t ₃ , I ₃)		A	--7.2.2
	-- Secondary output voltage (Ic1, V21), (Ic2, V22)		A	--7.2.3
	-- Primary voltage waveform τ		A	--7.2.5
	-- Dielectric Strength		A	--7.2.7
	-- Secondary output voltage (Ic1, V21), (Ic2, V22)	It shall satisfy the requirements specified in the drawing.	A	--7.2.3
	-- Built-in resistance of output terminal for tachometer		A	--7.2.8

Table 2 (continued)

Evaluation Item	Evaluation Standard			Quality Rank	Evaluation Method
Fire resistance	V - 0	V - 1	V - 2	A	7.6.1
	(1) Every sample shall not be flamed for 10 seconds or more.	(1) Every sample shall not be flame for 30 seconds or more.			
	(2) Total of the flaming time of the five samples shall not exceed 50 seconds.	(2) Total of the flaming time of the five samples shall not exceed 250 seconds.			
	(3) After the removal of secondary flame, the sample shall not be flamed for 30 seconds or more.	(3) After the removal of secondary flame, the sample shall not be flamed for 30 seconds or more.			
	(4) By the dropping materials from the flaming samples the surgical cotton of 305mm shall not be ignited.	(4)			