

**Conventional tools**

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1 voltmeter; measuring range 0–3 V, 0–15 V with 0.1 V scale graduation

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1 ohmmeter, measuring range starting 0.1 ohm

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**1. Testing series resistances**

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Loosen line connection on one connection of resistance to be tested.

Measure resistance with ohmmeter.

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Series resistance	Resistance nominal value at + 20°C
0.4 ohm	$0.4 \pm 0.05$ ohm
0.6 ohm	$0.6 \pm 0.05$ ohm

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For warmer series resistances, the measured values are slightly higher.

**2. Testing ignition coil**

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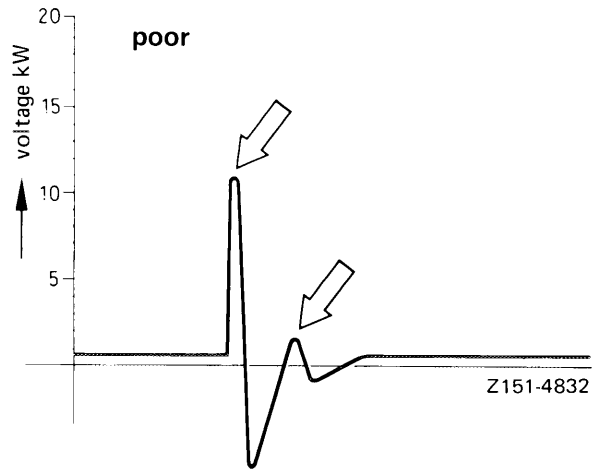
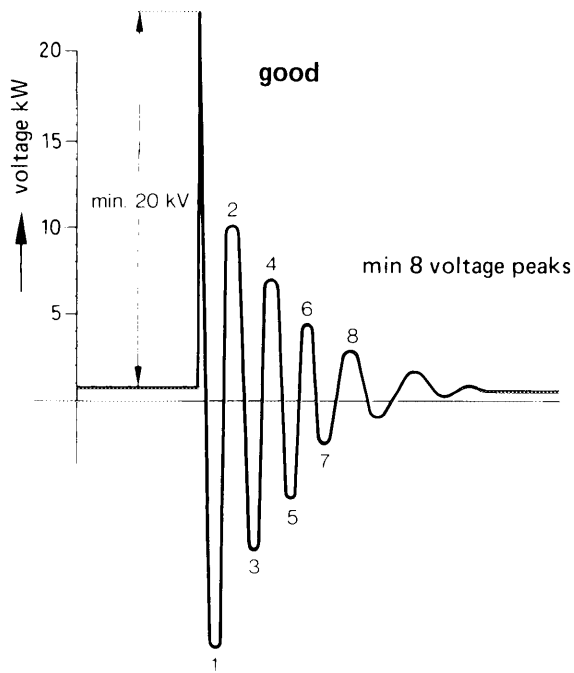
**Insulation test**

Separate ignition coil by removing terminals 1, 15, 4 from vehicle supply system.

Connect engine tester to ignition coil. Test according to operating instructions.

Whenever possible, test ignition coil with a suitable engine tester (e.g. SUN 745 or 1130) under operating conditions. The discovered faults are above all insulation damage, grounding and interturn shorts.

Evaluate voltage flow on scope according to subsequent illustration.



Display	Line-up
Fault	Voltage below 20 kV, less than 8 voltage peaks
Cause	Interturn interruption, interturn short or insulation damage against ground
Remedy	Renew ignition coil

#### Display evaluation

The ignition is perfect when the first oscillation attains 20 kV and at least 8 voltage peaks will follow. If this value is not attained, replace ignition coil.

#### Resistance test

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Resistance nominal value at + 20°C

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Primary winding measured between terminal 1 and 15	0.38–0.45 ohm
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Secondary winding measured between terminal 1 and 4	8–11 kΩ
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Measurements will be slightly higher when ignition coil is warmer.

### 3. Testing contact breaker point

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For perfect function of transistorized systems the transfer resistance on contact breaker point should not be too high. To check, measure voltage drop on closed contact breaker point.

Connect voltmeter: + to cable connector  
(= terminal 7 or TD on  
switchgear)  
— to ground

Voltage indication **max 0.3 volt**.

If this value is exceeded, install a new contact breaker.

### 4. Testing switchgear and line connections

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Check whether switchgear is connected to voltage or whether, if pertinently contacted, the switching transistor will lock the primary current of the ignition coil or let it pass. The primary current is not directly measured but, for the sake of simplicity, the voltage drop caused by this current.

Test with engine stopped and ignition switched on.

**Test voltage drop at input of 0.4 ohm resistance with contact breaker point closed.**

Connect voltmeter: + to input series resistance  
0.4 ohm  
— to ground

The voltage drop may amount to **max 0.4 volt**.

When voltage drop is too high, check cable and cable connections.

#### 4.1 Ge switchgear

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Check connections on series resistances, on cable connector and on ignition coil for perfect condition.

**Voltage with breaker point opened**

This will check the locking conduct of transistor.

Connect voltmeter: + to terminal 15 ignition coil  
— to ground

No voltage should be available at terminal 15 ignition coil, i.e. **readout = 0 volt.**

If readout is not 0 volt, the transistor in switchgear is no longer locking. Replace switchgear.

#### **Voltage with breaker point closed**

Voltmeter connected as before.

**Voltage at terminal 15 ignition coil = 2.6–3.5 volts.**

If not, transistor is no longer switching through. Replace switchgear.

With breaker point closed or opened, the voltage measured at terminal 1 of ignition coil amounts to **0 volt.**

If these values are above or below 0 volt, test series resistances, ignition coil and cables.

#### **4.2 Ge or Si switchgear — wheel house unit — in model 107**

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##### **Designation of 4-core connecting line on switchgear**

brown . . . . .	ground	
black . . . . .	terminal 16	to series resistance 0.6 ohm
red/black . . . .	terminal 15	to series resistance 0.4 ohm
green/yellow . .	terminal 7	to cable connector terminal 1 — ignition distributor

Check connections on series resistances, on cable connector and on ignition coil for perfect condition.

#### **Voltages with breaker points opened**

This will check the locking conduct of transistor.

Connect voltmeter: + to terminal 15 ignition coil  
— to ground

There should be no voltage at terminal 15 ignition coil, i.e. **readout = 0 volt.**

If readout is not 0 volt, the transistor in switchgear is no longer locking. Replace switchgear.

### **Voltage with breaker point closed**

Voltmeter connected as before.

**Voltage on terminal 15 ignition coil = 2.6--3.5 volts.**

If not, the transistor in switchgear is no longer switching through. Replace switchgear.

Voltage on terminal 1 of ignition coil with breaker point closed or opened amounts to **0 volt**.

If these values are below or above specifications, check series resistances, ignition coil and cables.

## **4.3 Si switchgear**

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### **Checking line connections**

Check connections on series resistances, on cable connector and on ignition coil for perfect condition. With the ignition switched on, the pulled off 3-pole plug of switchgear plug connection should be connected to battery voltage at terminals 15 and 16.

Connect voltmeter: + to terminal 15 or 16  
- to ground

### **Voltage with breaker point opened**

This will check the locking conduct of the transistor.

Connect voltmeter: + to terminal 15 ignition coil  
- to ground

Terminal 15 ignition coil should carry **battery voltage**. If not, transistors in switchgear are no longer locking. Replace switchgear.

### **Voltages with breaker point closed**

Voltmeter connected as before.

**Voltage on terminal 15 ignition coil = 8.2--9.6 volts.**

With breaker point closed, voltage on terminal 1 of ignition coil is **4.8--6.3 volts**; with breaker point opened, battery voltage.

If not, transistors are no longer switching through. Replace switchgear.

#### 4.4 Standard switchgear (Si)

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##### Inspection of line connections

Pull 4-pole connecting plug from switchgear and test with voltmeter for battery voltage at 4-point round plug terminal 15 and terminal 16 with ignition switched on.

Connect voltmeter: + 1 x to terminal 15 and  
1 x to terminal 16  
– to ground

If there is no voltage, test all connections from input 0.4 ohm resistance to switchgear.

Then put back 4-point round plug on switchgear.

##### Voltage with breaker point opened

This will check the locking conduct of the transistor.

Connect voltmeter: + to terminal 1 ignition coil  
– to ground

Terminal 1 should carry battery voltage.

If not, replace switchgear.

##### Voltage with breaker point closed

Voltmeter connected as before.

Voltage on terminal 1 ignition coil = **0.7--1.5 volts**.

With breaker point closed, **3.6--4.6** volts are measured on terminal 15 of ignition coil; with breaker point opened, battery voltage.

If not, replace switchgear.

## Values for testing switchgear

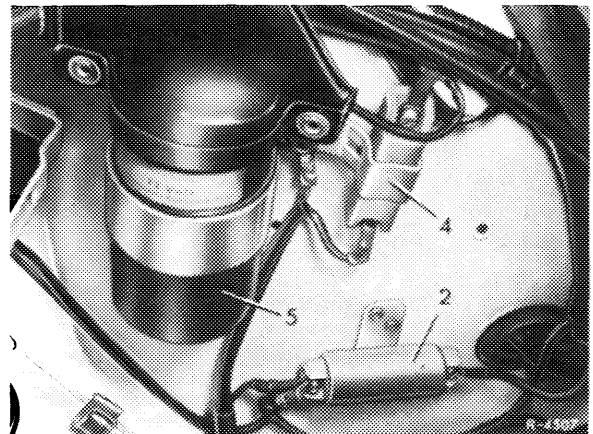
### Measuring points and associated voltages for transistorized (TSZ) systems

Voltmeter		Breaker point	Nominal voltages			Voltages outside nominal range: causes, remedies
Plus to	Minus to		Wheel house TSZ	Si-TSZ	Si standard TSZ	
Series resistance 0.4 ohm input	ground	closed	max 0.4 V below battery voltage			With correct battery voltage: Excessive voltage drop battery – 0.4 ohm series resistance caused by transfer resistances (corrosion), line interruption etc.
Pulled-off switchgear plug terminal 15		without significance	11.8–13.0 V	battery voltage		With correct voltage at 0.4 ohm series resistance: parallel resistance or circuit interruption between 0.4 ohm series resistance input and terminal 15 or terminal 16
terminal 16			0 V			
Cable connector terminal 7 or TD		closed	0–0.3 V			Higher voltage: transfer resistance on breaker point too high. Renew breaker point.
Ignition coil terminal 15		closed	2.6–3.5 V	8.2–9.6 V	3.6–4.6 V	With correct voltage at switchgear and terminal 7 or TD:
		opened	0 V	battery voltage		Switchgear defective
Ignition coil terminal 1	closed	0 V	4.8–6.3 V	0.7–1.5 V	Renew switchgear	
	opened		battery voltage			

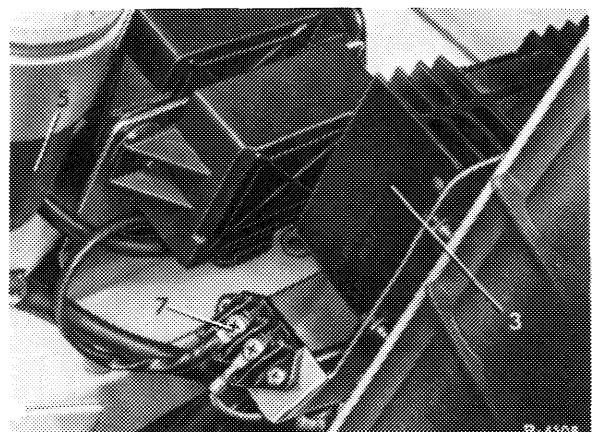
### Layout of individual components

Model 108.057/058, 109.056, 111.026/027

- 2 Series resistance 0.4 ohm
- 4 Series resistance 0.6 ohm
- 5 Ignition coil

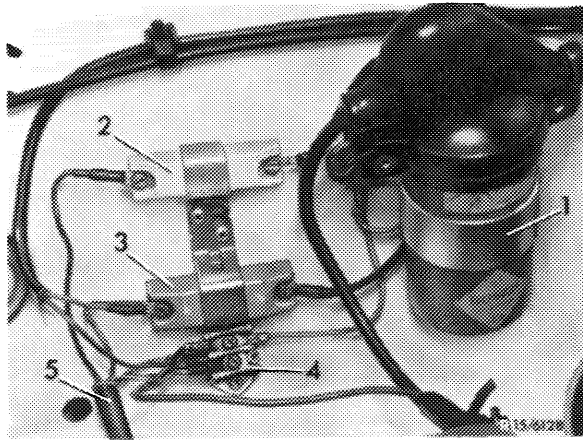


- 3 Switchgear
- 5 Ignition coil
- 7 Cable connector



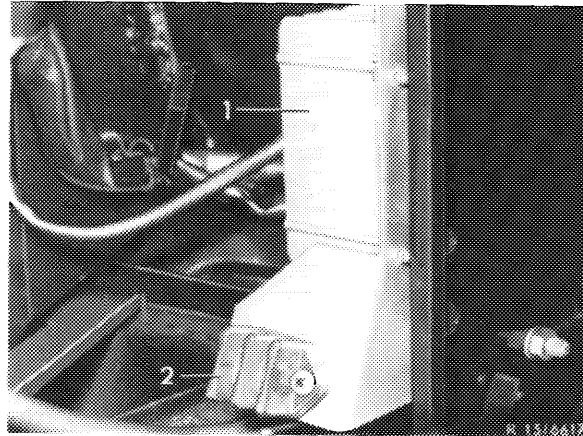
Model 107

- 1 Ignition coil
- 2 Series resistance 0.6 ohm
- 3 Series resistance 0.4 ohm
- 4 Cable connector
- 5 Line from switchgear

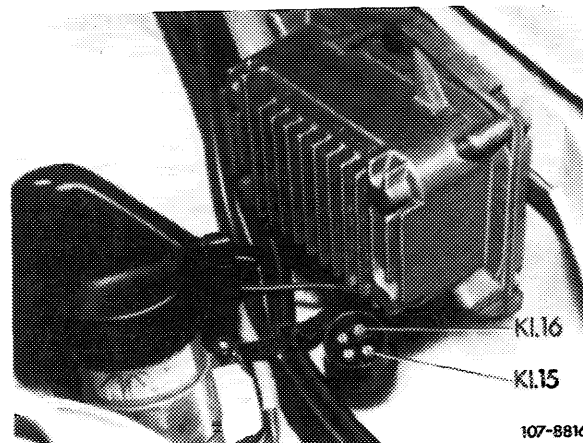
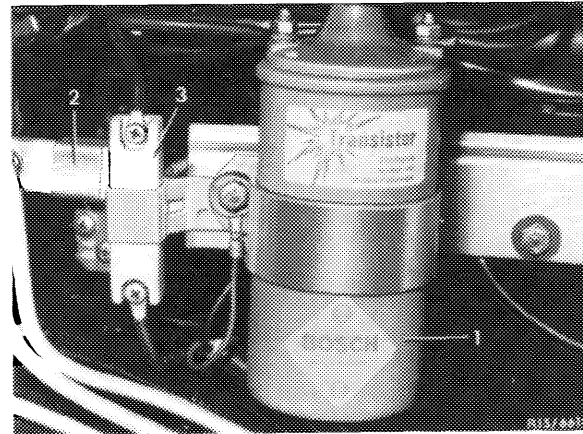


Model 108.067/068 (USA) , 109.057 (USA)

- 1 Switchgear
- 2 Cable connector

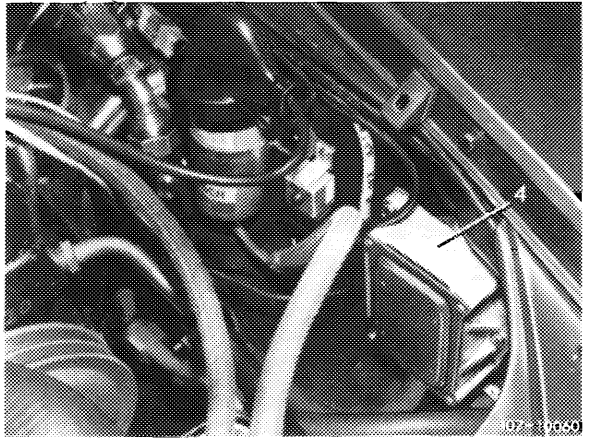


- 1 Ignition coil
- 2 Series resistance 0.4 ohm
- 3 Series resistance 0.6 ohm



107-8816





Switchgear layout model 107