A. Transistorized ignition system TSZ 4

Test values

Voltages

Battery	Rest potential (ignition switched on)		approx. 12 V
	Starting voltage (starter actuated)		approx. 10 V
Input voltage series resistor (0.4 Ω)			approx. 12 V
Ignition coil	Terminal 1 and ground		0.5–2.0 V
	Terminal 15 and ground		approx. 4.5 V
Switching unit	Round plug 4-pole	Terminal 15 and terminal 31	battery voltage
		Terminal 16 and terminal 31	0.5–2.0 V

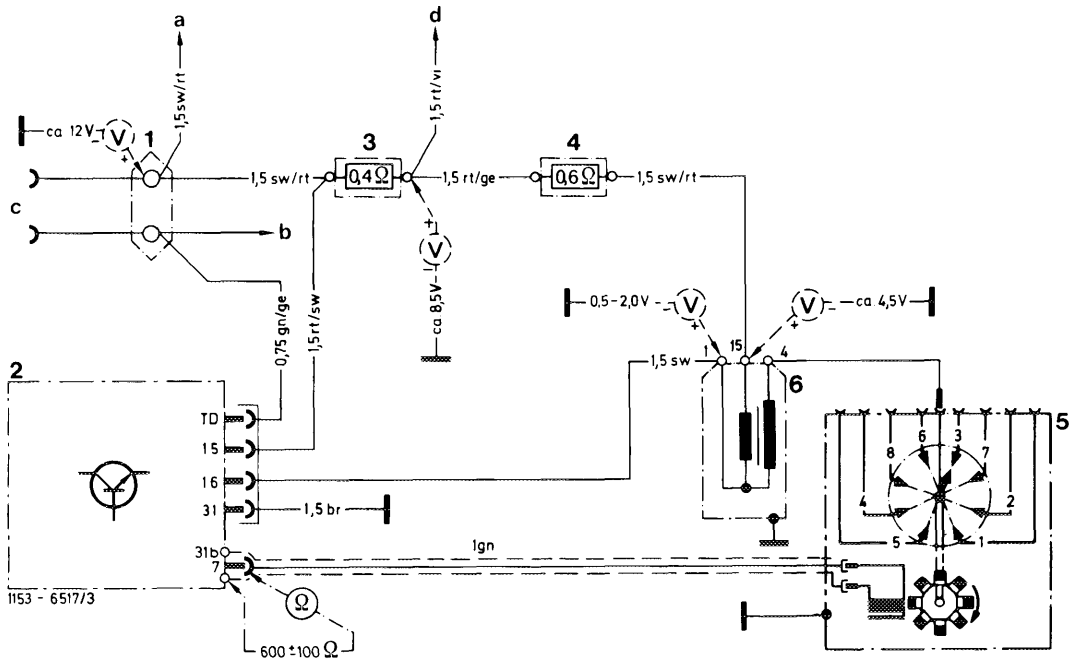
Resistors (test values with reference to +20 °C)

Ignition coil	primary (terminal 1 and 15)	0.33–0.46 Ω
	secondary (terminal 1 and 4)	7–12 kΩ
Series resistor	blue, anodized	0.4 ± 0.05 Ω
	metallic, anodized	0.6 ± 0.05 Ω
Distributor cap (per cylinder)		1 kΩ
Distributor rotor, spark plug connector		1 kΩ
Ignition distributor-transmitter section	Transmitter coil terminal 7 and terminal 31	600 ± 100 Ω
	Insulation terminal 7 and ground terminal 31 and ground	∞ or ≧ 200 kΩ
Dwell angle at	approx. 1500/min	25–39°
	approx. 5000/min[1])	33–40°

[1]) Perform dwell angle test at 5000/min only in the event of complaints about misfiring at high engine speeds.

Conventional testers

Voltmeter, ohmmeter, dwell angle measuring instrument



Wiring diagram breakerless transistorized ignition TSZ 4

1 Double cable connector
2 Switching unit
3 Series resistor 0.4 Ω
4 Series resistor 0.6 Ω
5 Ignition distributor with transmitter section
6 Ignition coil

a Ignition starter switch terminal 15
b Instrument cluster, revolution counter
c Diagnosis socket
d Terminal 16 starter

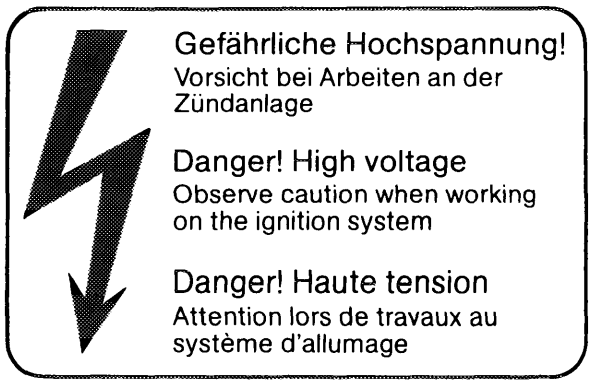
Line colors
br = brown
ge = yellow
gn = green
rt = red
sw = black

Note

During all jobs on ignition system, refer to "Notes concerning jobs on breakerless transistorized ignition system" (15–528).

Visual checkup

Check electric screw connections and plug connections of ignition system for tight seat.



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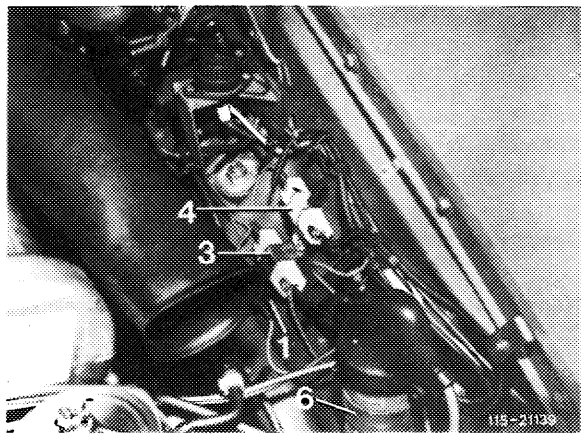
Testing voltages on battery

Rest potential

Switch on ignition and measure voltage on battery.

Nominal value: approx. 12 volts



Model 107

Starting voltage

Pull high voltage ignition cable 4 out of distributor cap and connect to ground. Operate starter while reading voltage.

Nominal value: approx. 10 volts

Voltage test on ignition system

Note: On this ignition system, with ignition switched on and engine stopped, a primary current of approx. 8 amps will be constantly available.

1 Input voltage on series resistor 0.4 Ω
Cable color black/red:

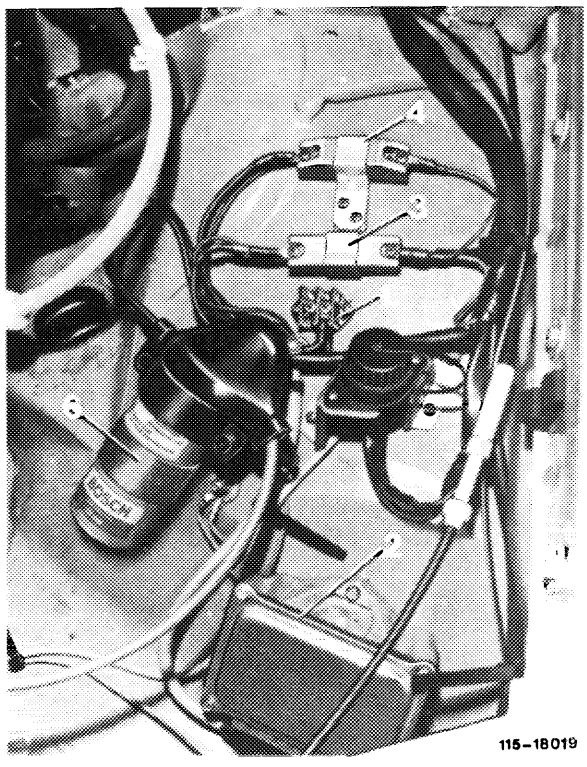
Nominal value: approx. 12 volts

2 Voltage on ignition coil

Terminal 15 and ground = approx. 4.5 volts
Terminal 1 and ground = 0.5–2.0 volts

a) If the value on terminal 1 is exceeded, the switching unit is defective and must be replaced.

b) If the value is obtained on terminal 1, but there is no ignition voltage (ignition spark) induced while starting, test transmitter section in ignition distributor and secondary winding of ignition coil.



Model 126

Bridging of series resistance

Switch on ignition. Pull high voltage ignition cable 4 from distributor cap and connect to ground (metal). Voltmeter at output of resistor 0.4 Ω, cable color red/yellow, connect to ground.

Operate starter and read voltage.

Nominal value: approx. 8.5 volts.

Resistance test

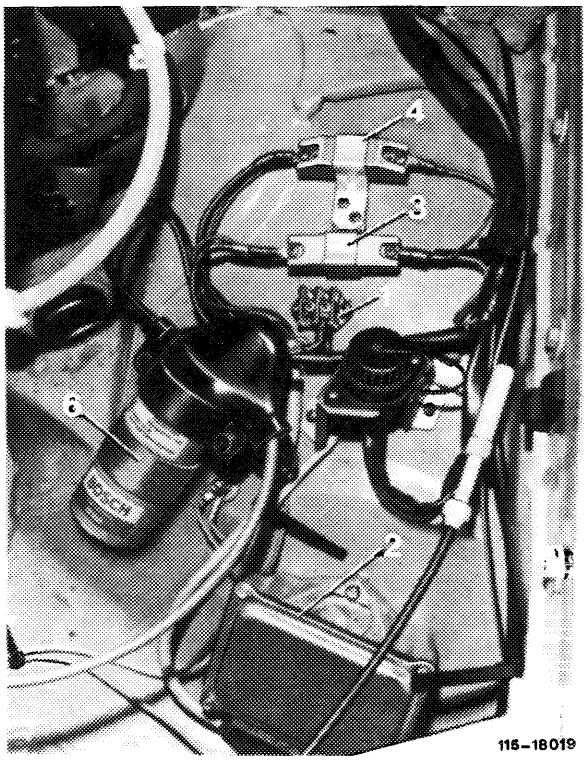
Series resistors

Loosen line connection on one connection of resistor about to be tested.

Measure resistance with ohmmeter.

Series resistor	Resistance nominal value at 20 °C
blue, anodized	0.4 ± 0.05 Ω
metallic, anodized	0.6 ± 0.05 Ω

On warmer series resistors, measured values will be slightly higher.

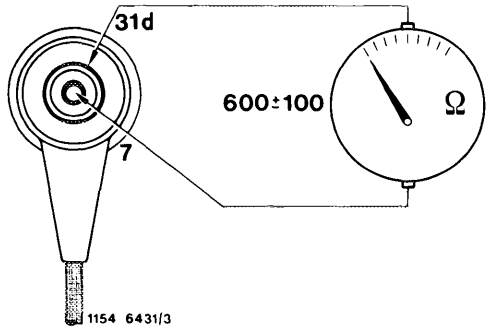


Ignition coil:

Primary winding terminal 1 and terminal 15
= 0.33–0.46 Ω

Secondary winding terminal 1 and terminal 4
= 7–12 kΩ

Testing ignition distributor-transmitter section

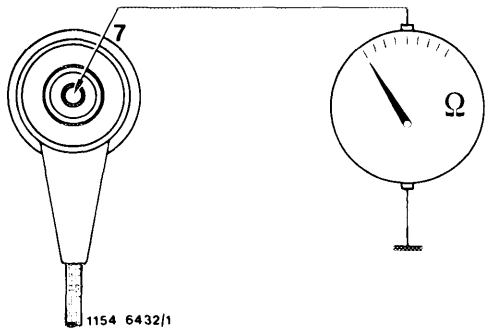


Pull control line of ignition distributor from switching unit and connect ohmmeter.

1 Test transmitter resistance between terminal 7 and 31.

Nominal value: 600 ± 100 Ω

Note: On cold engine, the ohmic value should be in lower half of specified value, on warm engine in upper half.



2 Test transmitter coil including control line for ground connection between terminal 7 or 31 and ground.

Nominal value: ∞ or ≧ 200 kΩ

3 Test transmitter section for mechanical damage. Make sure of air gap between rotor and stator.

Note: If a part of transmitter is defective, replace complete ignition distributor.

Testing dwell angle

Note: The dwell angle cannot be adjusted. Testing serves the purpose of checking operation of switching unit (dwell angle control).

Connect dwell angle measuring instrument.

Nominal value at

Engine speed	Dwell angle
1500 ± 50/min	25–39°
5000 ± 50/min [1])	33–40°

[1]) Perform test at 5000/min only in the event of complaints about misfiring and high engine speeds.

If this value is not attained when measuring dwell angle, test ignition distributor-transmitter section first. If transmitter section is in order, replace switching unit.

B. Transistorized ignition system without series resistors TSZ 8 z

Test values

Voltages

Battery	Rest potential (ignition switched on)		approx. 12 V
	Starting voltage (starter actuated)		approx. 10 V
Ignition (engine stopped)	Terminal 15 (jack 5 diagnosis socket)		battery voltage
	between terminal 15 and 1 (jack 5 and 4 diagnosis socket)		0 V
	Round plug 4-pole	Terminal 15 and terminal 31	battery voltage
		Terminal 16 and terminal 31	battery voltage

Resistors (test values with reference to +20 °C)

Ignition coil	primary (terminal 1 and 15)		0.3–0.6 Ω
	secondary (terminal 1 and 4)		6–15 kΩ
Distributor cap (per con ɔction)			1 kΩ
Distributor rotor, spar⌄ plug connector			1 kΩ
Ignition distributor-transmitter section	Transmitter coil terminal 7 and terminal 3		600 ± 100 Ω
	Insulation	terminal 7 and ground terminal 3 and ground	∞ or ≧ 200 kΩ

Dwell angle

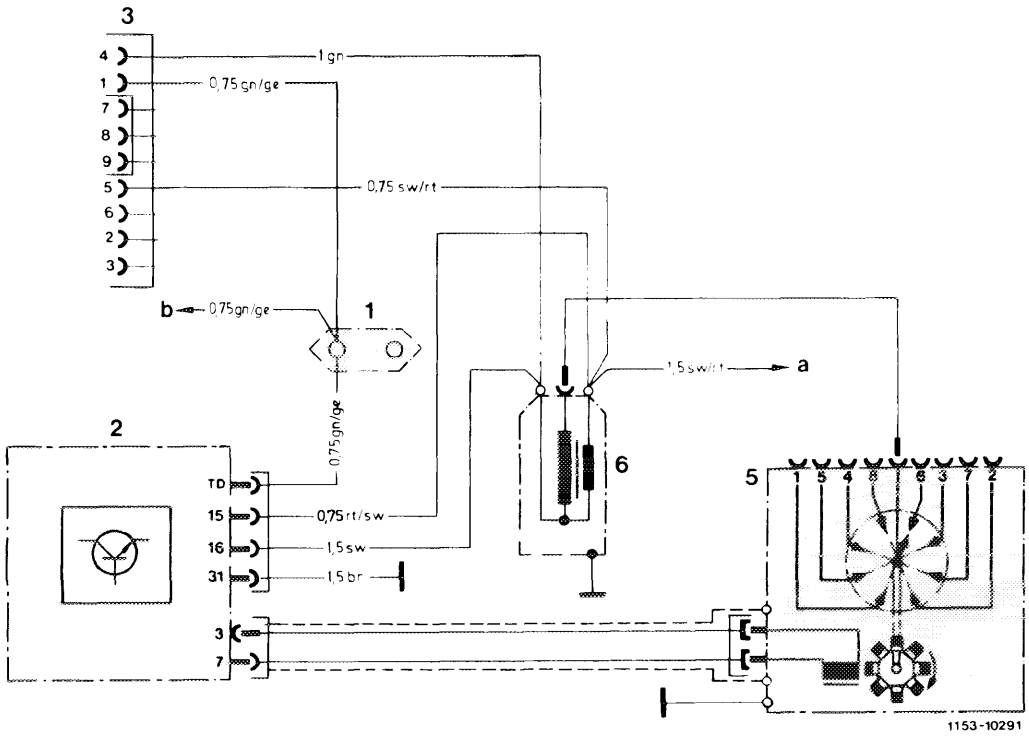
Terminal TD at starting speed	5–23°

Conventional testers

Voltmeter, ohmmeter, dwell angle measuring instrument

Note

During all jobs on ignition system, pay attention to "Notes concerning jobs on ignition system" (15–528).



Wiring diagram breakerless transistorized ignition TSZ 8 z without series resistors

1 Line connector
2 Switching unit
3 Diagnosis socket
5 Ignition distributor
6 Ignition coil

a To fuse box, input terminal 15
b To fuel pump relay with rpm limitation

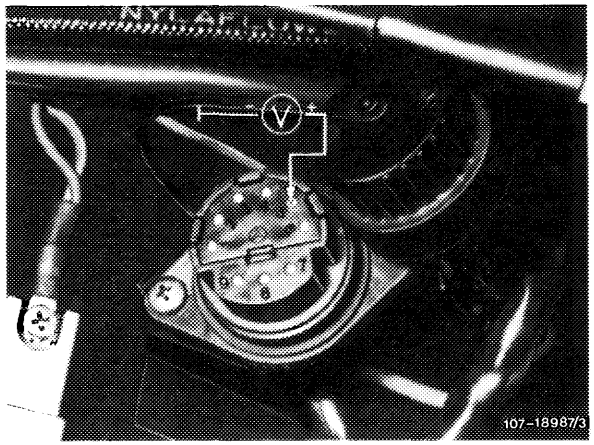
Line colors
br = brown
ge = yellow
gn = green
rt = red
sw = black

Testing

On jack 5 of diagnosis socket, test voltage (terminal 15) against ground. Ignition switched on.

Nominal value: battery voltage

Nominal value correct.	Nominal value wrong.

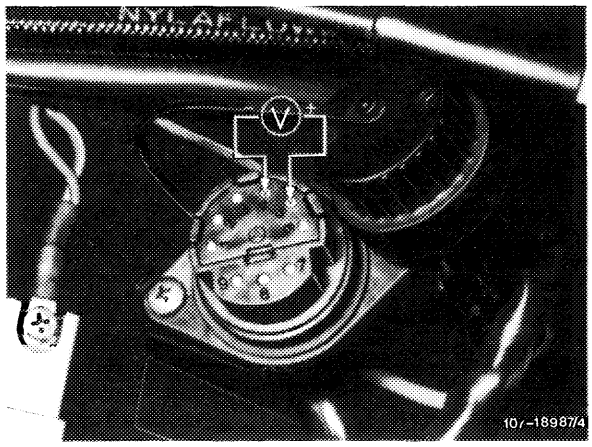


Test voltage supply via ignition lock.

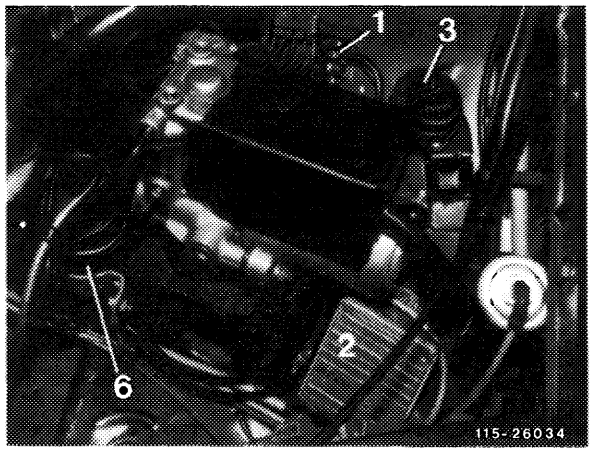
Test voltage difference between jack 5 and 4 (terminal 15 and 1) of diagnosis socket.

Nominal value: 0 volt

Nominal value correct.	Nominal value wrong (voltage > 0.1 volt). Switch off ignition immediately.



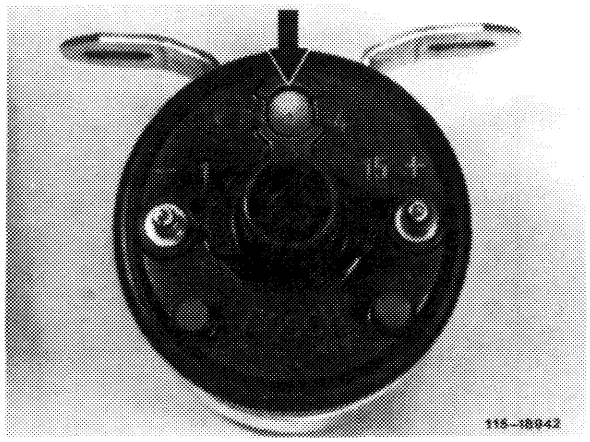
Renew switching unit.



Check plug in ignition coil and test primary resistor of ignition coil (between terminal 1 and 15, 0.3–0.6 Ω).

With plug pushed out or if resistance is wrong, renew ignition coil.

End of test



Test dwell angle at starting speed on diagnosis socket or terminal TD.

Nominal value: from 5–23°

Nominal value correct.	Nominal value no readout.	Nominal value above 23°.

End of test

Renew switching unit.

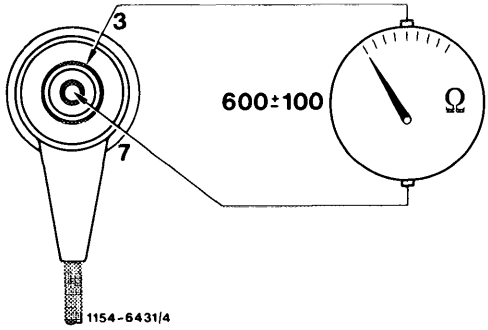
End of test

Test ignition distributor-transmitter section for interruption and interturn short-circuit.

Pull green control line from switching unit. Test resistance between terminal 7 and 3 with ohmmeter.

Nominal value: 600 ± 100 Ω

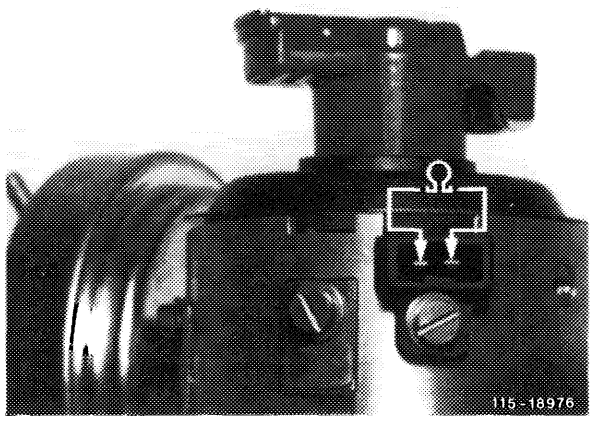
Nominal value correct.	Nominal value wrong.



Pull plug connection of green control line from ignition distributor and test with ohmmeter on plugs whether 600 ± 100 Ω are indicated.

If nominal value is attained, renew green control line.

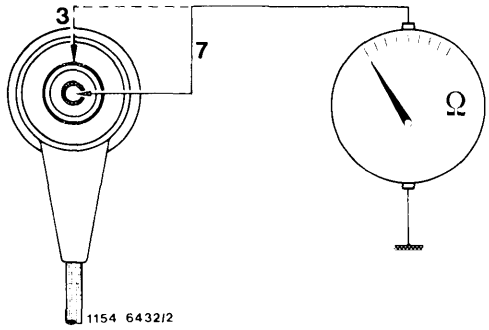
If nominal value is not attained, renew ignition distributor.



Test ignition distributor-transmitter section for short against ground.

Pull green control line from switching unit. Connect ohmmeter to terminal 3 and to ground, and connect terminal 7 and ground.

Nominal value: ≧ 200 kΩ or ∞.

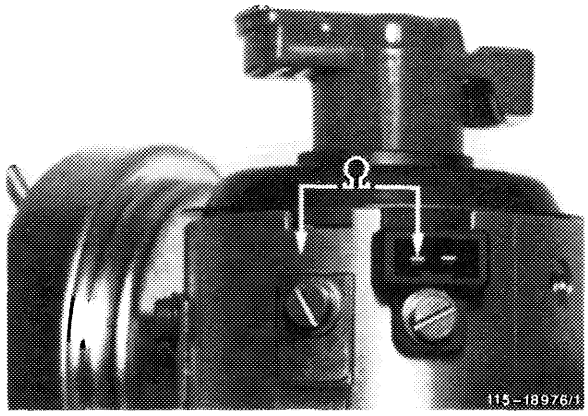


Nominal value correct.	Nominal value wrong.

Pull plug connection of green control line from ignition distributor. Test resistance at one of the two plugs on ignition distributor against ground.

Nominal value on both plugs: ≧ 200 kΩ or ∞.

If the nominal value is not attained at a plug, renew ignition distributor.



End of test