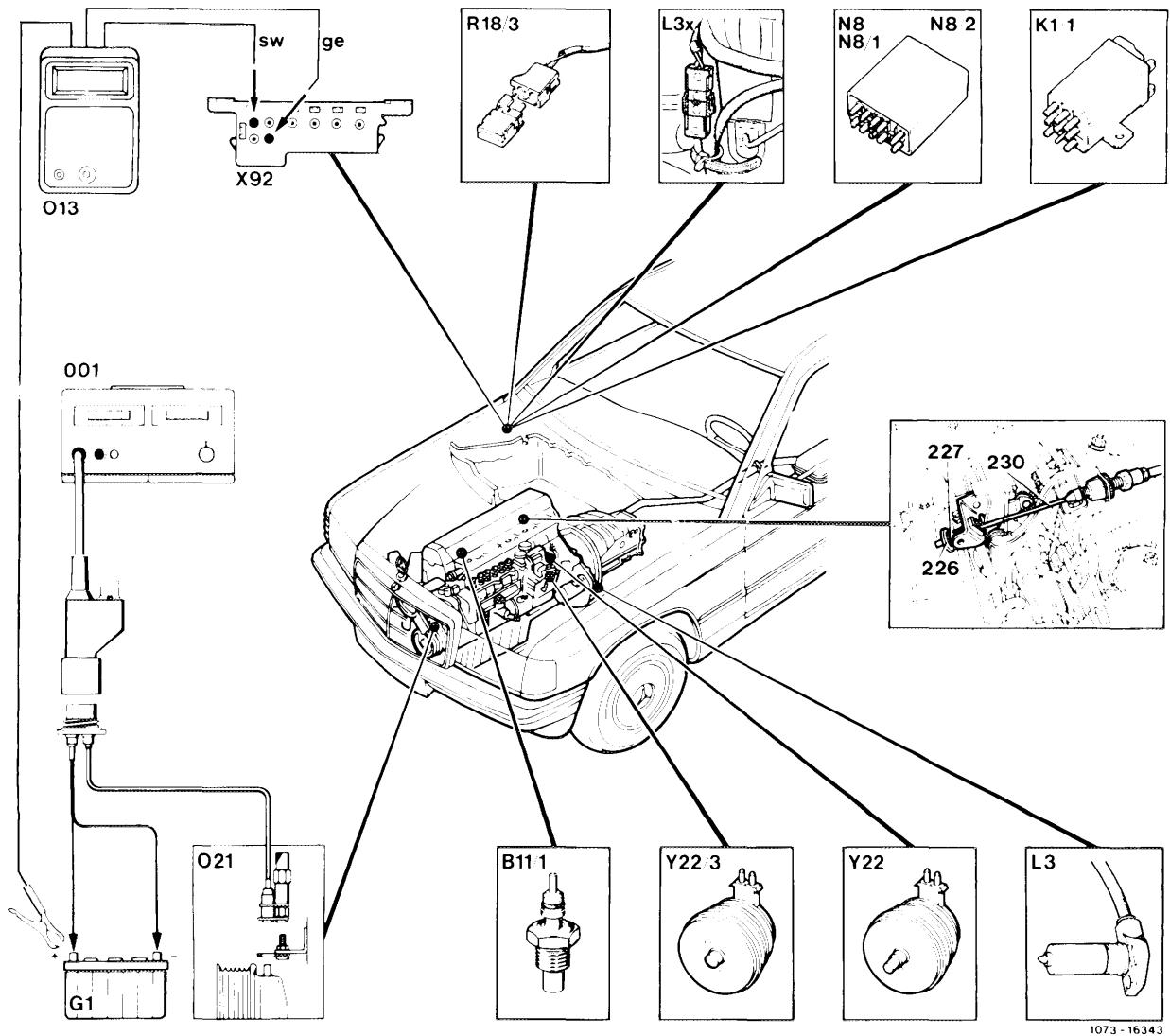


07.1-105 Checking electronic idle speed control (ELR)



Digital tester (001) and pulse generator (021)	connect, disconnect.
Impulse counter (013) to battery (G1) and test coupling (X92)	connect.
Control for easy operation	check
Idle speed stop on Bowden cable (230)	check, the spring retainer (226) must contact the compression spring (227) without preload.
Overvoltage protection fuse	check.

Engine run at coolant temperature to 60-80 °C.
 Engine run at idle speed.
 Starting key of impulse counter (013) actuate 2 to 4 seconds.
 Display read and note down.
 Starting key again actuate, if no new display appears no further fault is in the system.

Impulse display	Component-Control circuit
1	All functions "in order"
2	Speed signal "Fault"
3	Coolant temperature "Fault"
6	Control circuit ELR "Fault"

Only short-circuit faults are identified by control units with "RO1".
 Control units with "RO2" are also able to identify interruption.
 Production breakpoint: Control unit with "RO2" May 1988.



Impulse display "2"
 Speed sensor (L3) on coupling (L3x) check, speed signal voltage > 2.8 V AC
 Resistance 0.4-2.5 kΩ
 Engine at idle speed voltage > 4 V AC.

Impulse display "3"
 Coolant temperature sensor (B11.1) check, set value at +20 °C 2.2-2.8 kΩ.

Impulse display "6"

Pull double coupling off ELR electromagnetic actuator (Y22) and refit (at least 3 s)

Engine speed rises briefly.

Idle speed without control, plug on electromagnetic actuator pulled off check, adjust if required.

Set values see table.

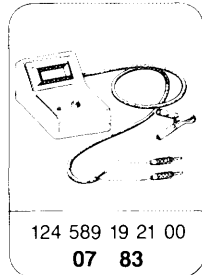
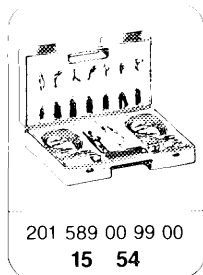
If fitted, pull off individual adjustment plug (R18/3), glow starter switch in position "2"

check voltage. Set value: approx. 5 V.

Test and adjusting values

Engine	Idle speed 1/min Electronic idle speed control (ELR)	
	with control	without control Plug pulled off electrom. actuator
602	680 ± 20	620 ± 40

Special tools



Commercially available tools

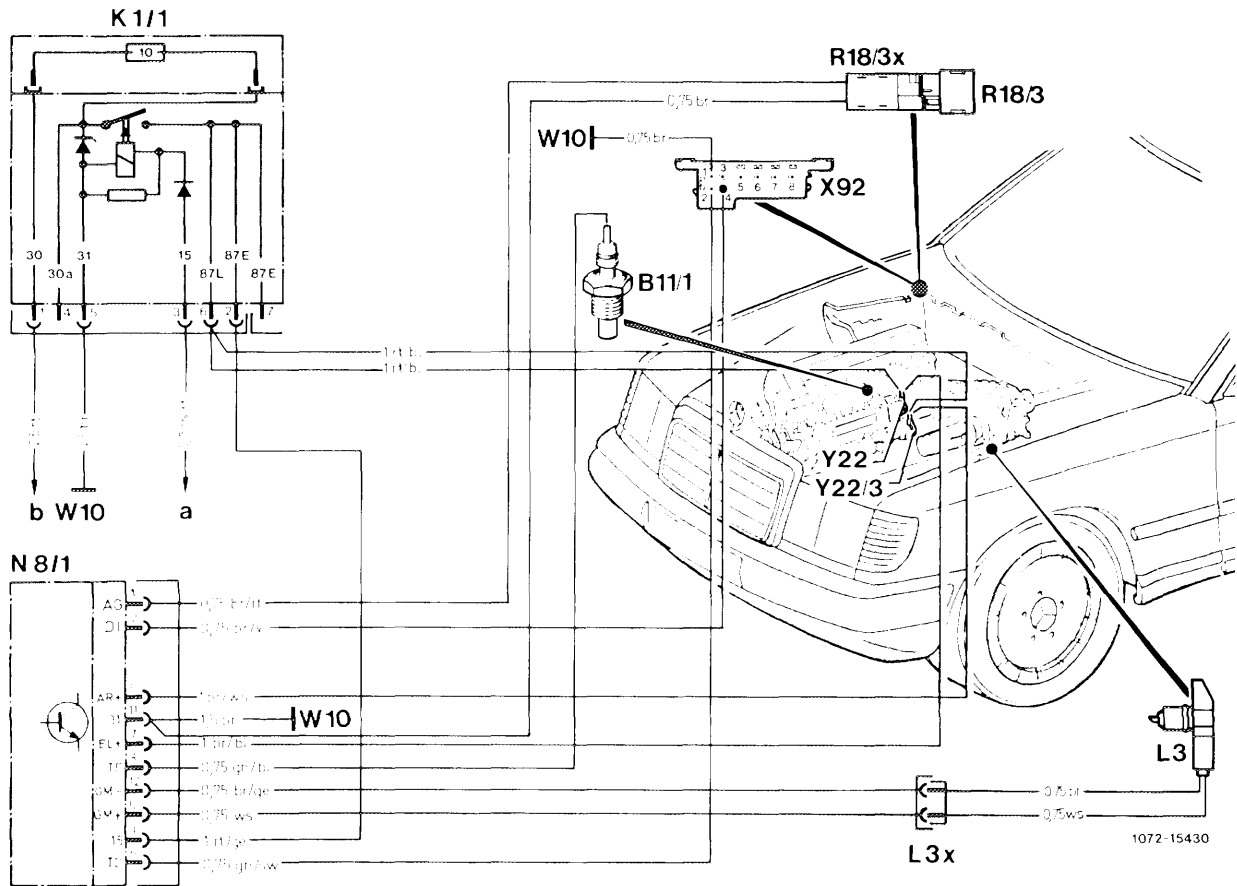
Multimeter

e.g. Sun, DMM-5

Digital tester

e.g. Bosch, MOT 002.02

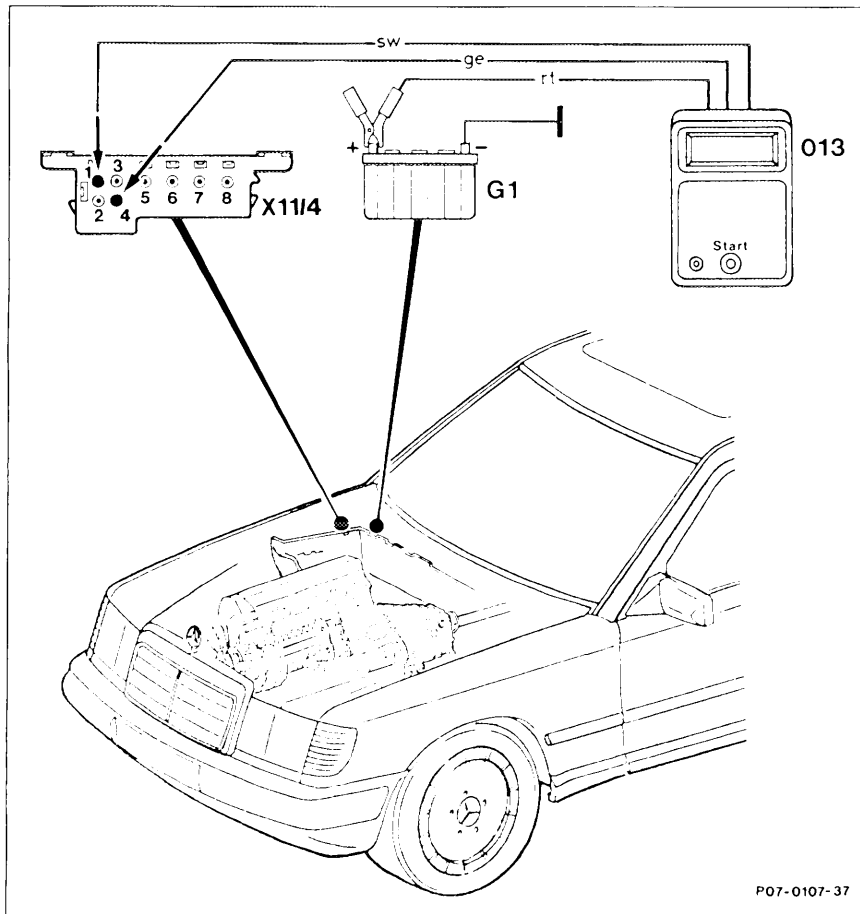
Sun, DIT 9000



Function diagram idle speed control

- | | | | |
|-------|---|--------|---|
| B11/1 | Temperature sensor (ELR) | R18/3x | Connector, individual adjustment plug |
| K1/1 | Oversvoltage protection relay | W10 | Ground, battery, spring dome |
| L3 | Starter ring gear speed sensor | X92 | Test coupling |
| L3x | Connector, starter ring gear speed sensor | X22 | Electromagnetic actuator ELR (only 603) |
| N8/1 | Control unit (ELR) | Y22/3 | Electromagnetic actuator ARA (non-U.S.) |
| | ELR only with 6 cylinders | a | Connector X26 jack 1 terminal 15 |
| R18/3 | Individual adjustment plug (as required) | b | Terminal block (X7) terminal 30 |

Checking



Connect digital tester (001) and pulse generator (021).

Connect impulse counter (013) to battery (G1) and test coupling (X92).

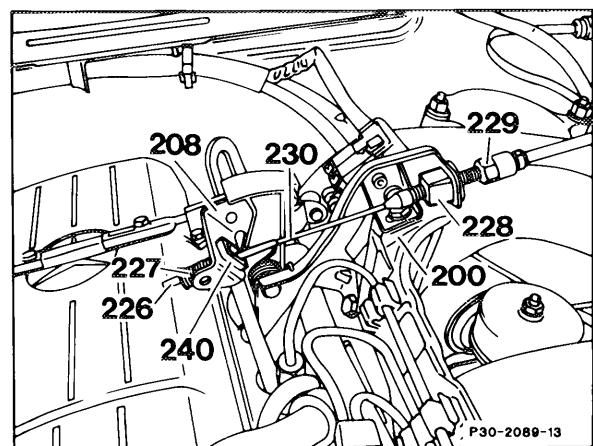
- If the LED U-Batt appears after **connecting**, impulse counter and voltage supply for impulse counter are in order.

Note

LED U-Batt in the display field must light up, if not:

- a) Check impulse counter fuse.
- b) Check jack 1 of test coupling (X92) against battery plus (approx. 12 V).
- c) Check jack 4 of test coupling (X92) against battery plus (approx. 12 V).

Check control for easy operation.



Check idle speed stop on Bowden cable (230).

The spring retainer (226) of the Bowden cable (230) in idle speed position must contact the compression spring (227) without preload.

Check fuse on overvoltage protection. Run engine to 60-80 °C coolant temperature.

Run engine at idle speed.

Actuate starting key of impulse counter (013) for 2 to 4 seconds.

Read display of impulse counter (013) and note down.

Again press start key for 2 to 4 seconds. If no further fault is in the system, no new display will appear.

Correct noted faults according to the test program or carry out individual parts test.

Notes on impulse display

Figures from 1 to 6 appear on the impulse counter display.

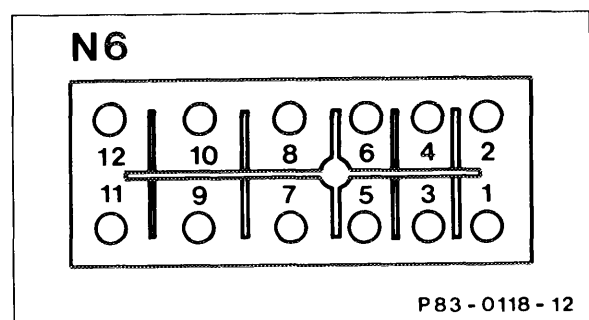
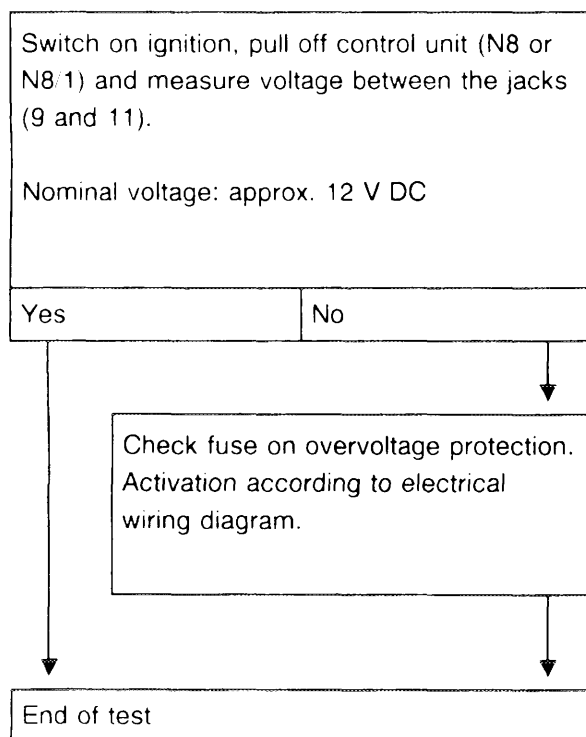
Figure 1 means that no fault has been registered in the electronic system. All other figures are allocated to a certain group of faults.

The number of impulses shows if and which component is faulty, or if components in the control circuit are defective.

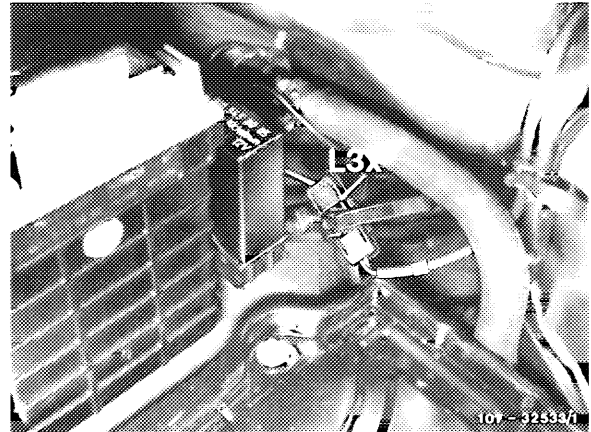
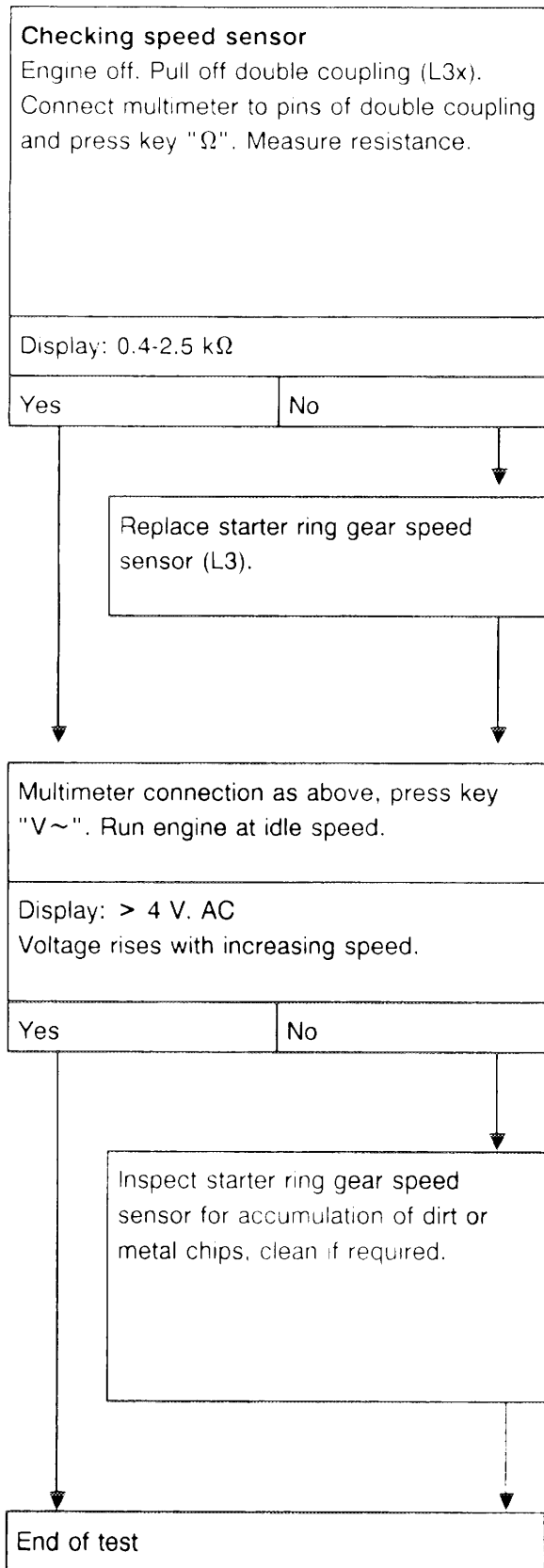
Impulse display	Component/Control circuit
1	All functions "in order"
2	Speed signal "Fault"
3	Coolant temperature "Fault"
6	Control circuit ELR "Fault"

Checking individual components

Check overvoltage protection (K1/1)



Impulse display "2"



Impulse display "3"

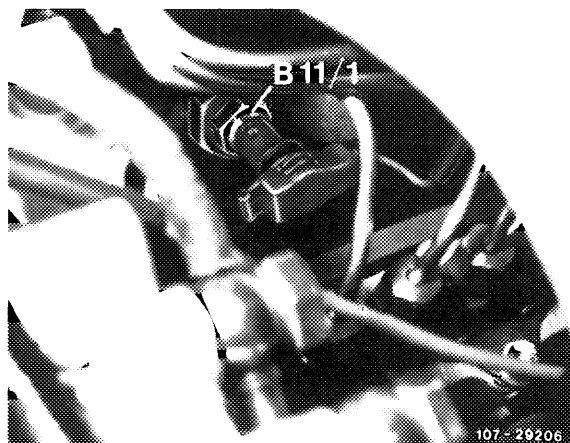
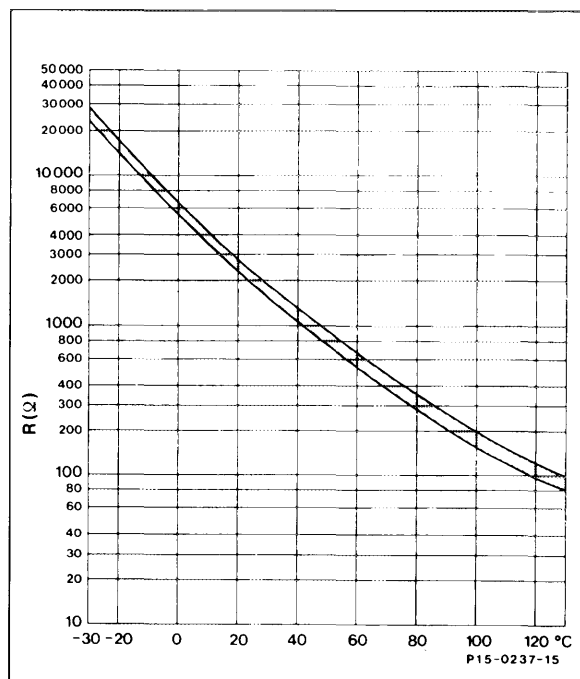
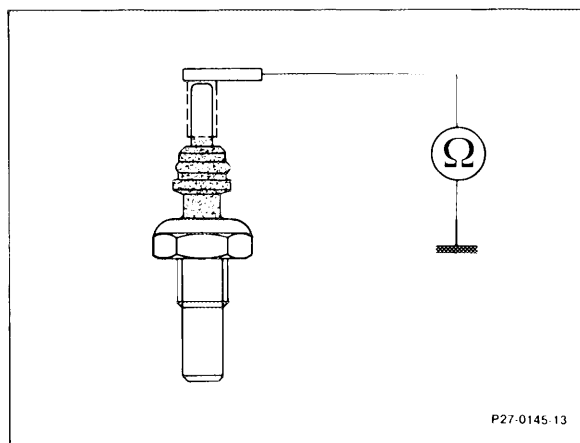
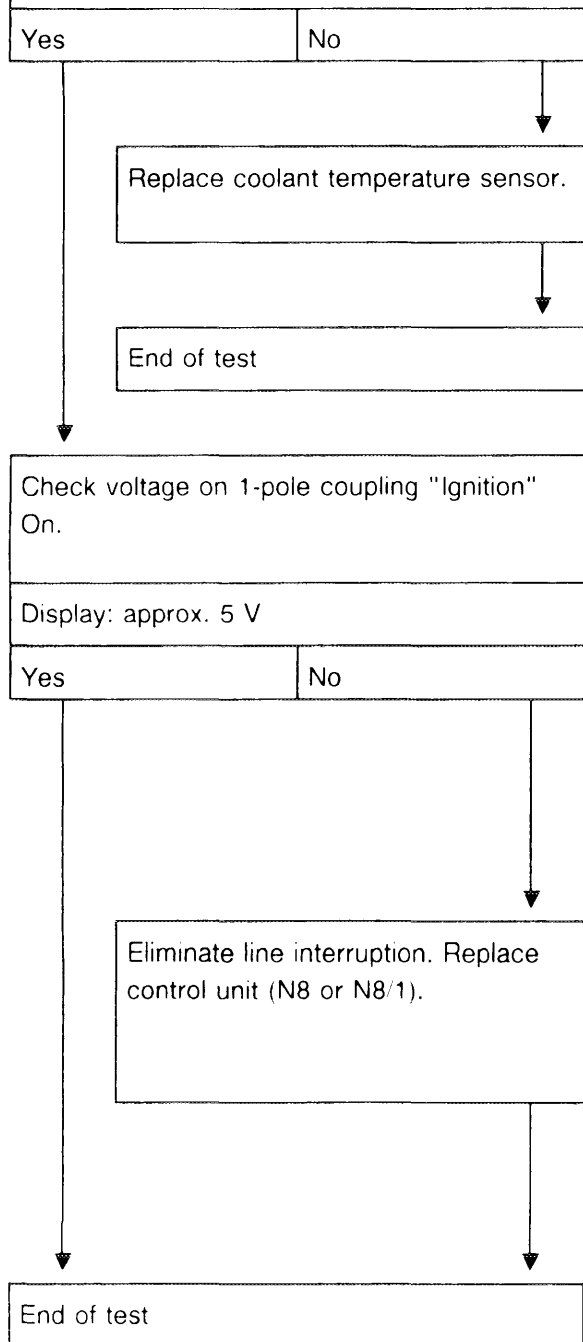
Checking coolant temperature sensor (B11/1)

Engine off. Pull plug off temperature sensor and check resistance to ground. See diagram and check resistance at two temperatures.

Example:

+ 20 °C = 2.2-2.8 kΩ

+ 80 °C = 290-370 Ω

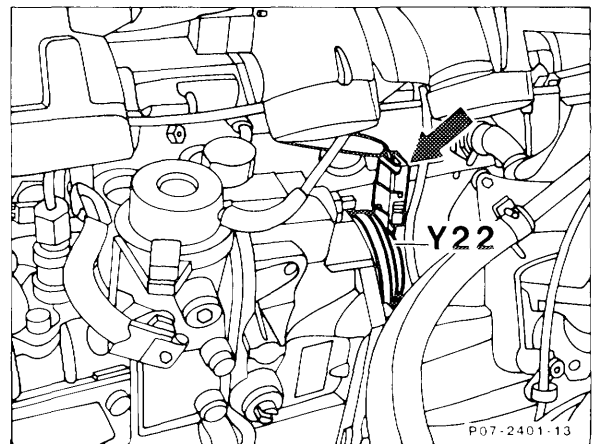


Impulse display "6"

Engine idling. Remove double coupling (arrow) from ELR electromagnetic actuator (Y22) for at least 3 sec. and reconnect.

Upon reconnecting, the idle speed should briefly increase above normal.

Yes	No
-----	----

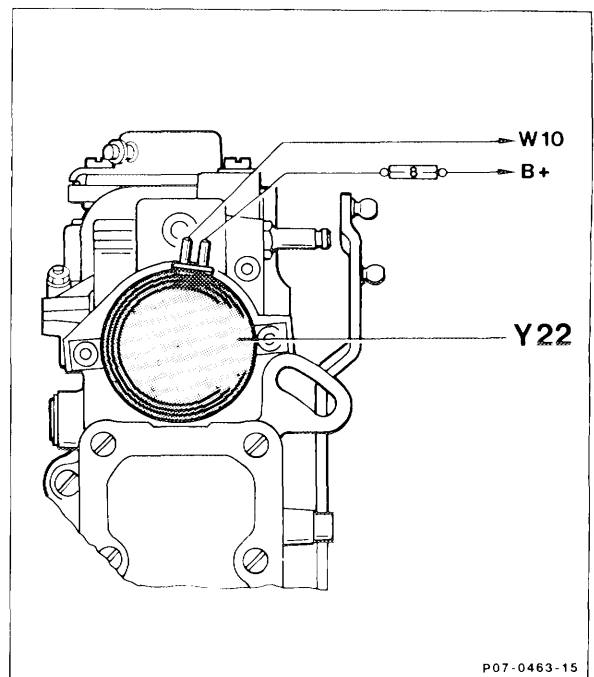


Apply battery voltage to ELR electromagnetic actuator (Y22) for a maximum of 3 sec..

Caution! If the voltage is applied for longer than 3 sec., the ELR electromagnetic actuator will be damaged.

Idle speed increases.

Yes	No
-----	----



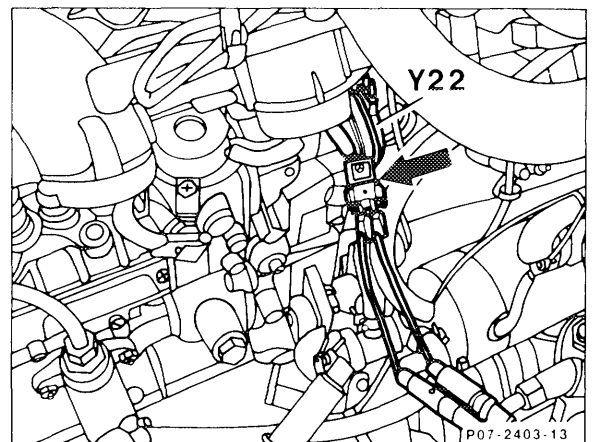
Replace electrom. actuator.

End of test

Engine idling. Remove double coupling (arrow) from electromagnetic actuator (Y22). Connect multimeter and set to "V =".

Display: approx. 12 V

Yes	No
-----	----



Check lines according to wiring diagram. Check fuse of overvoltage protection relay K1 1.

If lines are OK, replace control unit (N8 1).

End of test

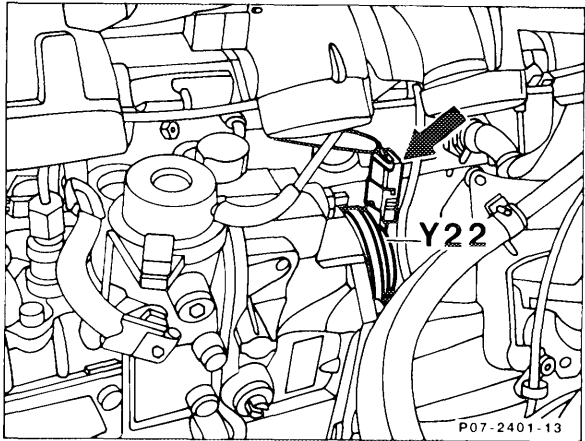
Engine idling. Remove double coupling (arrow) from ELR electromagnetic actuator (Y22).

Check idle speed.

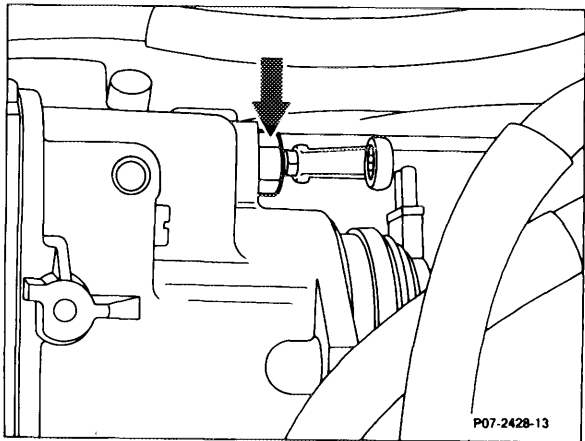
Set values:

Engine	Idle speed/min
602	620 ± 40

Yes No



Loosen lock nut and adjust idle speed (arrow).
left = higher
right = lower



End of test