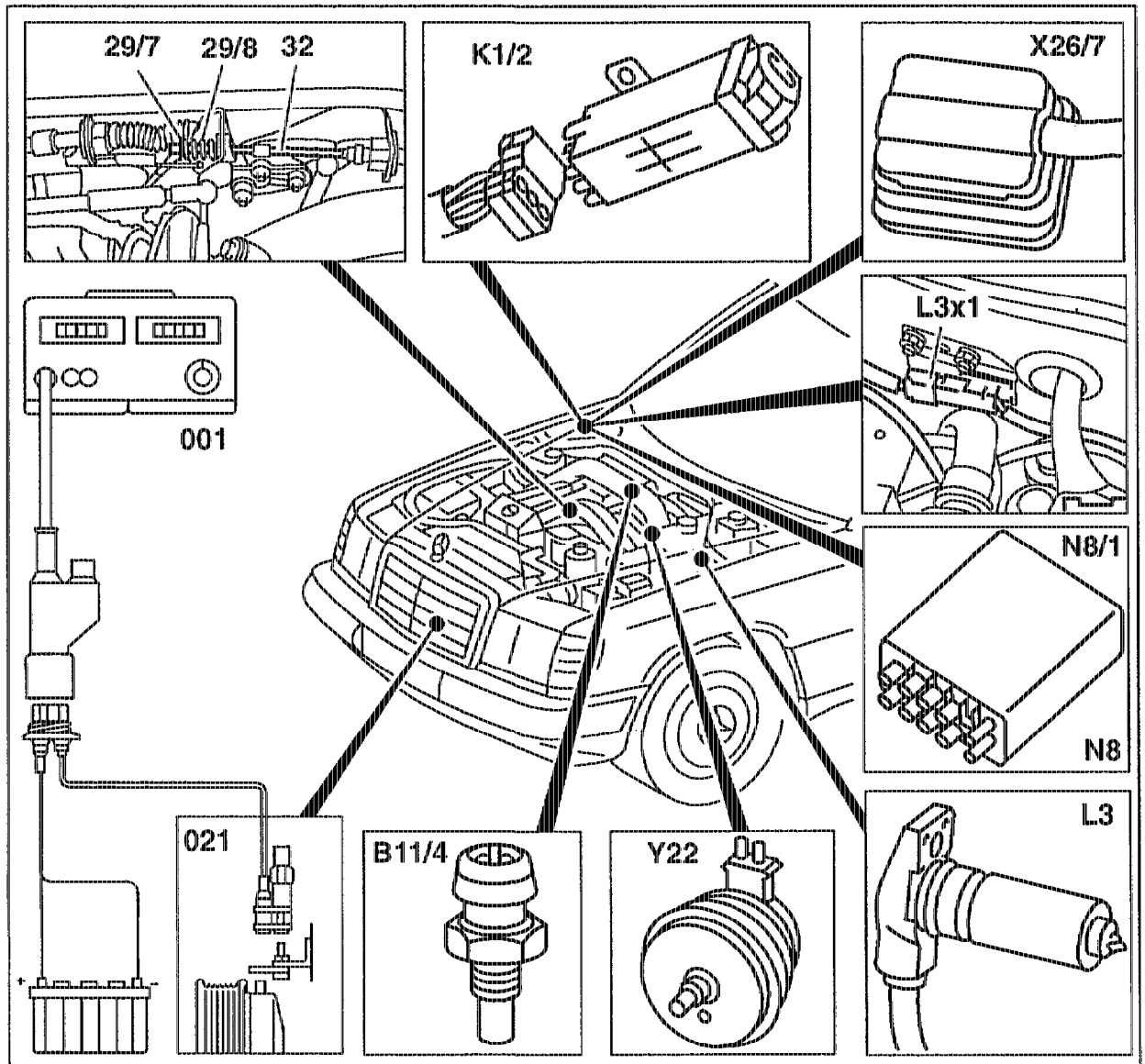


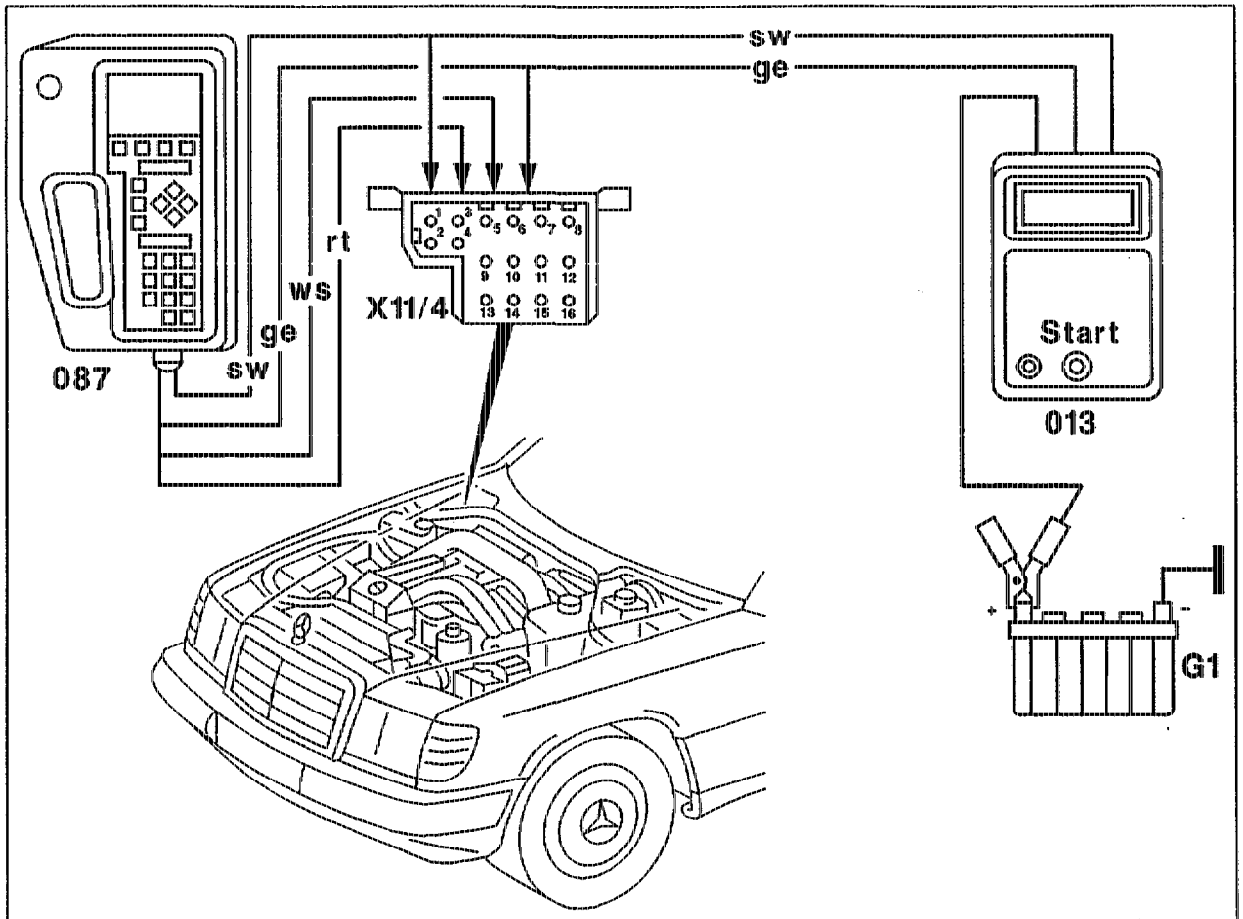
Operation no. of operation texts and work units or standard texts
and flat rates:
07-2005

Engine 606.910



P07-6404-59

Connection diagram of digital tester without adapter, location of components



P07-6530-57

Connection diagram of pulse counter, hand-held tester

013 Pulse counter
087 Hand-held tester

X11/4 Test coupling for diagnosis (16-pin)
G1 Battery

Pulse counter

Black cable Terminal 31 (ground) or contact 1
Red cable Terminal 15 (ignition), terminal 30 (battery) or contact 16
Yellow cable Contact 4 (ARA, ELR/ARA control unit)

Hand-held tester

Black cable Terminal 31 (ground) or contact 1
White cable Terminal 15 (ignition) or contact 16
Red cable Terminal 30 (battery), X4/10 (terminal block) or contact 3
Yellow cable Contact 4 (ARA, ELR/ARA control unit)

Enlarged fault memory

Fault code	Possible cause
1	No fault stored
2	Speed sensor (L3)
3	ELR temperature sensor (B11/4)
5	ELR actuator (Y22), ELR control loop "short circuit"
8	ELR actuator (Y22), ELR control loop "open circuit"
9	Control unit (N8, N8/1) faulty

Digital tester (001) and pulse generator (021)	connect, disconnect.
Accelerator control for ease of movement	check.
Idle speed stop at Bowden cable (32)	check; the spring plate (29/7) must be resting free of tension against the compression spring (29/8).
Overvoltage protection fuse	test.
Battery voltage	test, approx. 12 V. Measured at overvoltage protection between contacts 1 and 5.
Engine to coolant temperature of 60 – 80 °C ...	warm up.

Test with pulse counter

Pulse counter (013) to battery (G1) and to test coupling (X11/4)	connect according to connection diagram, disconnect.
--	--

Note

LED U-Batt in display panel must come on; if not:

- Test fuse of pulse counter.
- Test contact 1 of test coupling (X11/4) to battery positive (approx. 11 – 12 V).
- Test contact 4 of test coupling (X11/4) to contact 1 (approx. 6 – 12 V).

Engine	run at idle speed.
Start button of pulse counter (013)	press for 2 – 4 seconds.
Display	read and note.
	Readout "1": no fault
	Readout greater than "1": fault in system
Start button of pulse counter (013)	press once again for 2 – 4 seconds.
	If there is no further fault in the system, the previous readout reappears. If there is a further fault in the system, its fault code is displayed.

Noted faults after test program
 "testing individual components"
 Fault memory

rectify.
 erase by pressing start button of pulse counter
 and reading rectified fault. Then press start
 button for 6 – 8 seconds.

Note
 Each fault displayed must be erased individually.
 Once the fault is rectified and erased, the fault
 code no longer appears during fault output.
 A digit greater than 1 displayed, further faults in
 system.

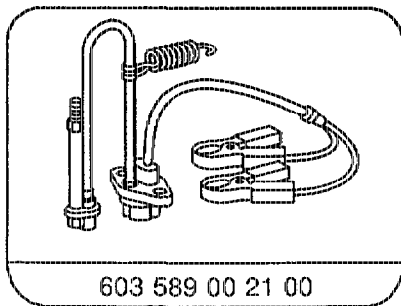
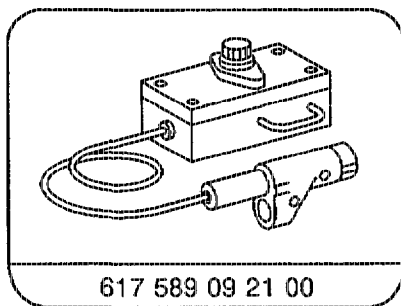
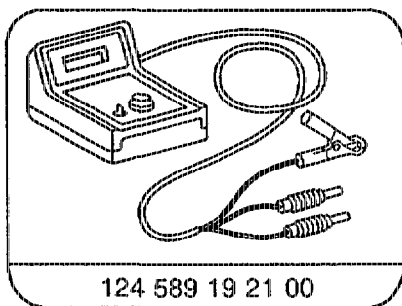
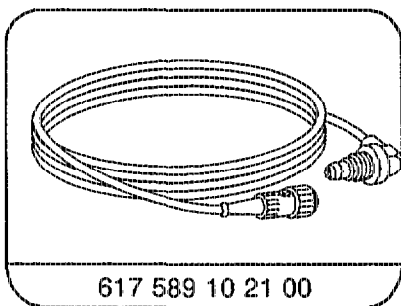
Test with hand-held tester

Hand-held tester (087) according to
 connection diagram

connect, disconnect.
 The test cycle is integrated in the HHT program.

Note
 Reading, erasing fault memory, see operating
 instructions of hand-held tester.

Special tools



Commercially available tools and testers (see Workshop Equipment Manual)

Designation	e. g. make, order no.
Multimeter	Sun, DMM-5 Fluke 23 DB, 83, 88 ITT Metrix MX 47, 50, 51, 52
Use without adapter	
Digital tester	Sun, DIT 9100 AVL, Diesel-Tester 873 Bosch, ETD 019.02
Use with adapter	
Digital tester Engine diagnostics tester	Bosch, MOT 103, 002.02, 150, 250 Hermann D960, D980 Bear, DEACE
Additional testers	
Hand-held tester	Mercedes-Benz AG 70322 Stuttgart VP/SDI 6511 0001 99
Y distributor	MB part no. 117 078 01 45

Function test

Test step/ Test scope	Tester/ Test connection	Operation/ Requirement	Specification	Possible cause/Remedy
Idle speed control	Tachometer with TDC sensor	Engine idling Coolant temperature approx. 80 °C Separate plug connection (L3x1)	630 ± 20 rpm 570 ± 40 rpm	Control unit (N8) or (N8/1) Overvoltage protection relay (K1/2) Starter ring gear speed sensor (L3) Plug connection, starter ring gear speed sensor (L3x1) ELR actuator (Y22) Wiring

Testing individual components

Fault code	Test step/ Test scope	Tester/ Test connection	Operation/ Requirement	Specification	Possible cause/ Remedy
1	-	-	-	-	No fault
2	2.0 Starter ring gear speed sensor (L3) Voltage	N8 or N8/1 10 —(←(V)→) 12	Control unit (N8) or (N8/1) removed Engine: Start Idle speed	> 3 V ~ ¹⁾	Plug connection (X26/7) (L3), clearance, dirt Plug connection, starter ring gear speed sensor (L3x1) Wiring
	2.1 Resistance	N8 or N8/1 10 —(←(V)→) 12	Control unit (N8) or (N8/1) removed	Beru 527 Ω ²⁾ ± 10 % VDO 1900 Ω ²⁾ ± 10 % AB-Elektronik 1040 Ω ²⁾ ± 10%	Plug connection (X26/7) Starter ring gear speed sensor (L3) Plug connection, starter ring gear speed sensor (L3x1) Wiring

¹⁾ Voltage rises as engine speed increases

²⁾ Measured at ambient temperature of 20 °C (each 10 °C change in ambient temperature alters resistance by 4 %)

Testing individual components

Fault code	Test step/ Test scope	Tester/ Test connection	Operation/ Requirement	Specification	Possible cause/ Remedy																				
	2.2 Wiring	N8-N8/1 L3x1 10 —(← Ω →)— 2 12 —(← Ω →)— 1	Control unit (N8-N8/1) removed Plug connection (L3x1) separated	< 1 Ω																					
3	3.0 Temperature sensor (B11/4) Resistance	N8 or N8/1 8 —(← Ω →)— 11	Control unit (N8-N8/1) removed	<table border="1"> <tr> <td>°C</td> <td>Ω</td> </tr> <tr> <td>20</td> <td>2500</td> </tr> <tr> <td>30</td> <td>1700</td> </tr> <tr> <td>40</td> <td>1170</td> </tr> <tr> <td>50</td> <td>830</td> </tr> <tr> <td>60</td> <td>600</td> </tr> <tr> <td>70</td> <td>435</td> </tr> <tr> <td>80</td> <td>325</td> </tr> <tr> <td>90</td> <td>245</td> </tr> <tr> <td>100</td> <td>185</td> </tr> </table>	°C	Ω	20	2500	30	1700	40	1170	50	830	60	600	70	435	80	325	90	245	100	185	(B11/4) Plug connection (X26/7) Wiring
°C	Ω																								
20	2500																								
30	1700																								
40	1170																								
50	830																								
60	600																								
70	435																								
80	325																								
90	245																								
100	185																								
	3.1 Wiring	N8-N8/1 B11/4 8 —(← Ω →)— 2 11 —(← Ω →)— 4	Control unit (N8-N8/1) removed Plug connection (B11/4) disconnected	< 1 Ω	Plug connection (X26/7)																				
Б or B	4.0 ELR actuator (Y22)	X26/7 7 —(← V →)— 4	Engine: idling Control unit (N8-N8/1) installed Blip throttle briefly	11-14 V Voltage drops	Control unit (N8), (N8/1) Overvoltage protection relay (K1/2) Starter ring gear speed sensor (L3) Plug connection, starter ring gear speed sensor (L3x1) Wiring																				
	4.1 Resistance	N8 or N8/1 7 —(← Ω →)— 9	Control unit (N8-N8/1) removed	$4 \pm 0.5 \Omega^2$	ELR actuator (Y22) Plug connection (X26/7) Wiring																				
	4.2 Wiring	N8-N8/1 Y22 7 —(← Ω →)— 1 9 —(← Ω →)— 2	Control unit (N8-N8/1) and coupling at (Y22) disconnected	< 1 Ω	Plug connection (X26/7)																				
9	5.0 ELR-ARA control unit (N8-N8/1)	—	—	—	Control unit (N8), (N8/1)																				

1) Voltage rises as engine speed increases

2) Measured at ambient temperature of 20 °C (each 10 °C change in ambient temperature alters resistance by 4 %)