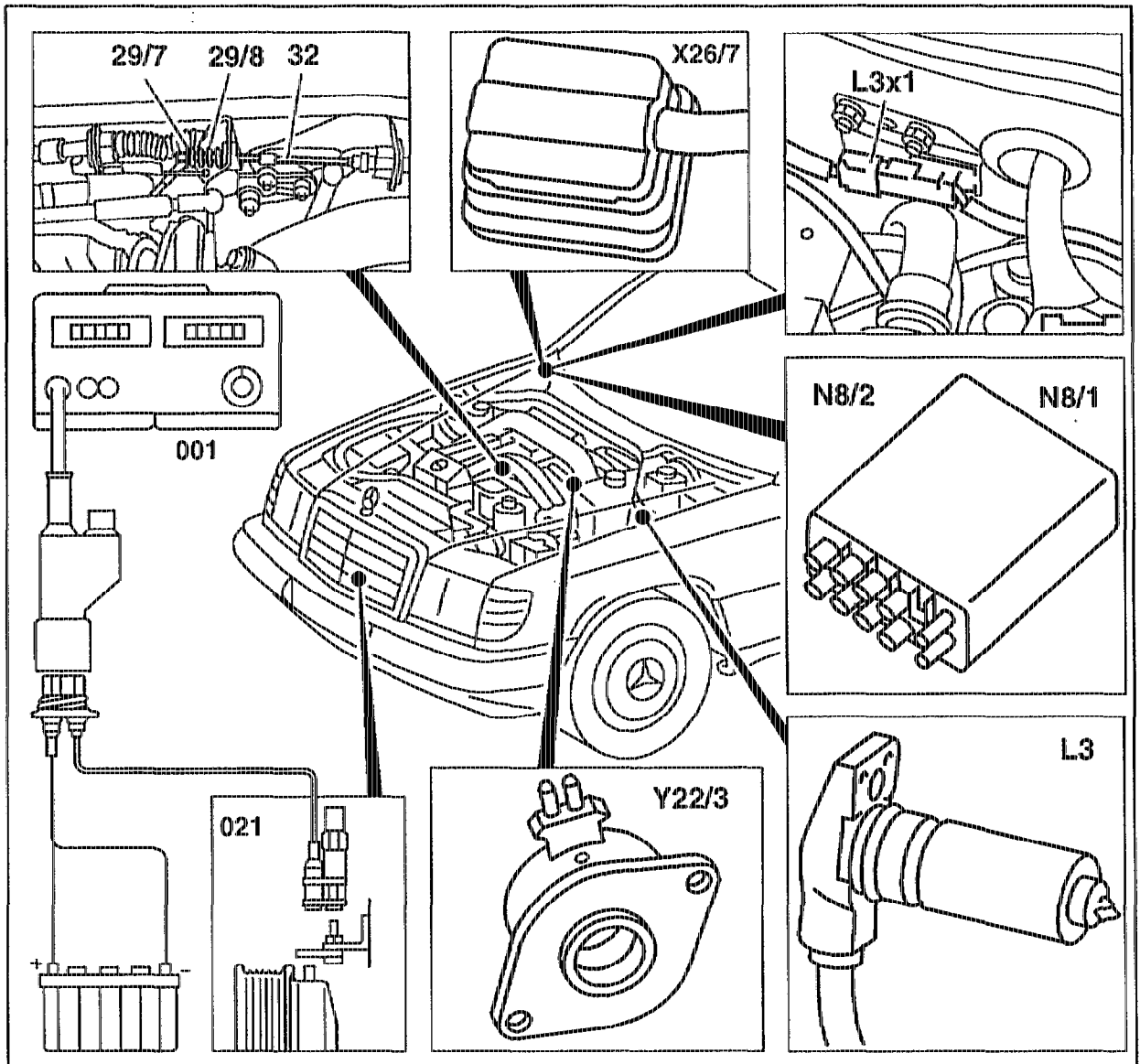


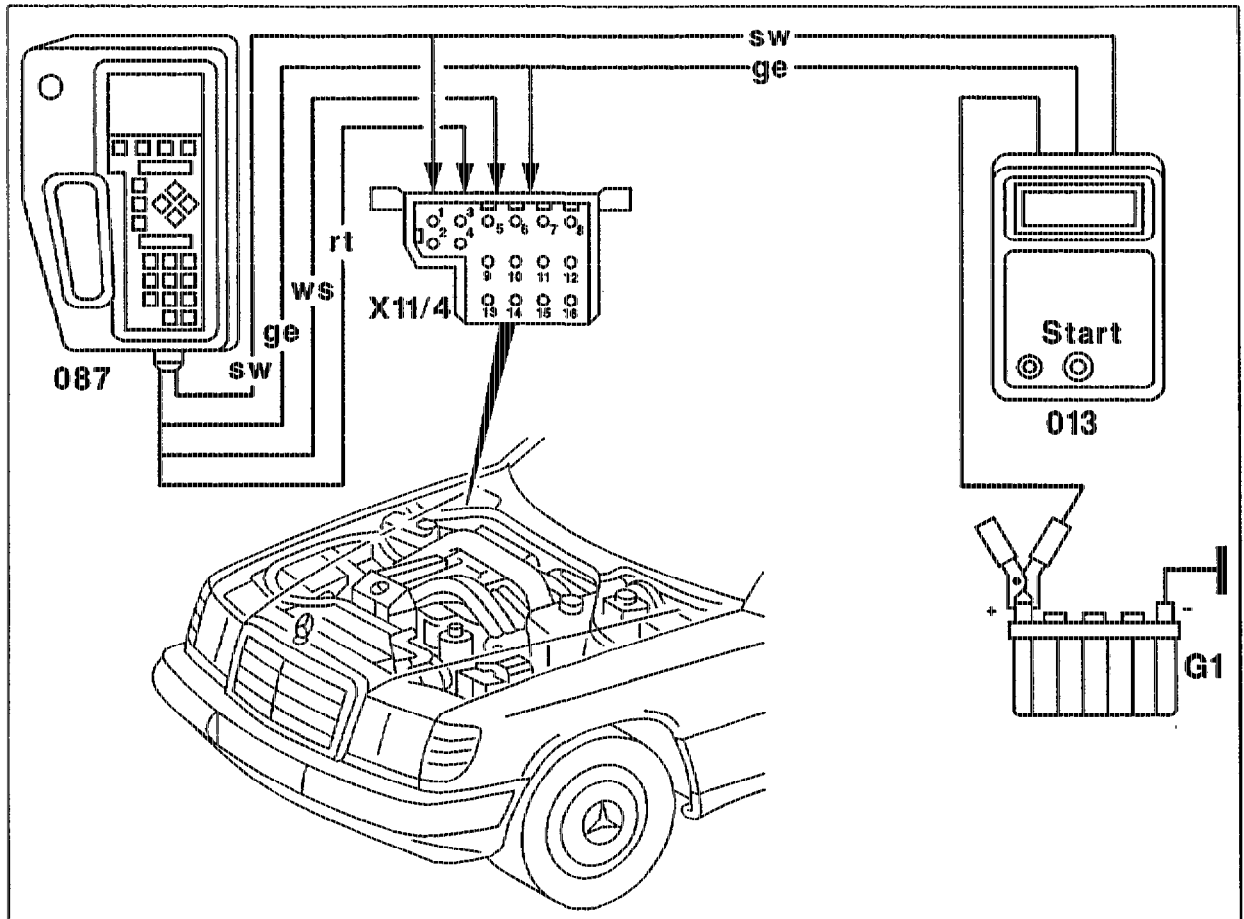
07.1-1840 Testing anti-jerk control (ARA)

Operation no. of operation texts and work units or standard texts
and flat rates:
07-1840



P07-6403-59

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
■	No fault stored
■	Speed sensor (L3)
■	ARA actuator (Y22/3), ARA control loop "short circuit"
■	ARA actuator (Y22/3), ARA control loop "open circuit"
■	Control unit (N8/1, N8/2) 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:

- a) Test fuse of pulse counter.
- b) Test contact 1 of test coupling (X11/4) to battery positive (approx. 11 – 12 V).
- c) 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 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. Engine 605.911 see section "a"
 Engine 606.910 see section "b"

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 has been rectified and erased,
 the fault code no longer appears during the fault
 output.
 Digit greater than 1 displayed, further faults in
 system.

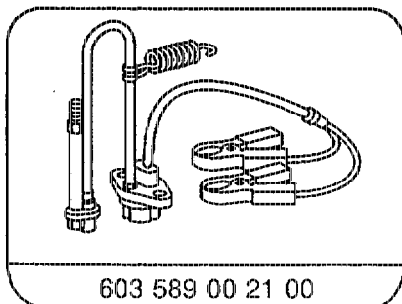
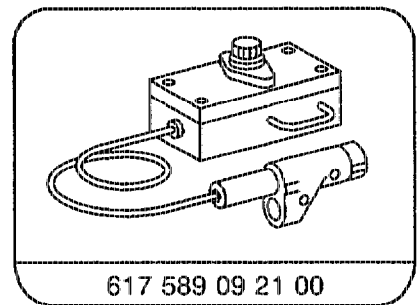
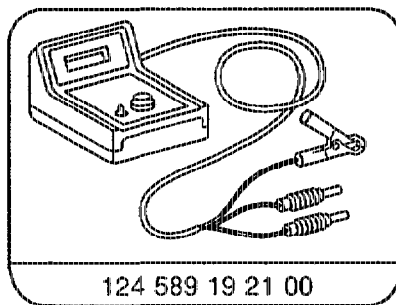
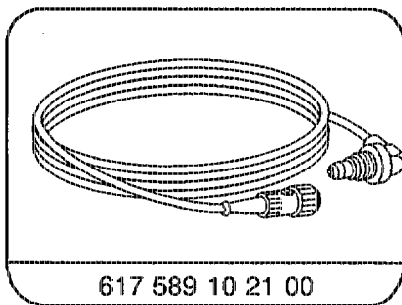
Test with hand-held tester

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 diagnostic tester	Bosch, MOT 103, 002.02, 150, 250 Hermann D960, D980 Bear, DEACE
Additional testers	
Hand-held tester	Mercedes-Benz AG 70322 Stuttgart 60 VP/SDI 6511 0001 99
Y distributor	MB part no. 117 078 01 45

a) Testing individual components, engine 605.911

Fault code	Test step/ Test scope	Tester/ Test connection	Operation/ Requirement	Specification	Possible cause/ Remedy
1	1.0	-	-	-	No fault stored
2	2.0 Starter ring gear speed sensor (L3) Voltage	N8/2 10 —(←(⊖)→)— 12	Control unit (N8/2) removed Engine: Start Idle speed	> 3 V~ ¹⁾	(L3), clearance, dirt Plug connection, starter ring gear speed sensor (L3x1)
	2.1 Resistance	N8/2 10 —(←(⊖)→)— 12	Control unit (N8/2) removed	Beru 527 Ω ²⁾ ± 10 % VDO 1900 Ω ²⁾ ± 10 % AB-Elektronik 1040 Ω ²⁾ ± 10%	(L3) Plug connection, starter ring gear speed sensor (L3x1) Wiring
	2.2 Wiring	N8/2 L3x1 10 —(←(⊖)→)— 2 12 —(←(⊖)→)— 1	Control unit (N8/2) removed Plug connection (L3x1) separated	< 1 Ω < 1 Ω	
5 or 7	3.0 ARA actuator (Y22/3) Voltage supply	X26/7 3 —(←(⊖)→)— 4	Coupling at (X26/7) dis- connected Engine: Start Idle speed Blip throttle briefly	< 1V Voltage rises	Control unit (N8/2) Speed sensor (L3) Plug connection, starter ring gear speed sensor (L3x1) Wiring
	3.1 Resistance	N8/2 5 —(←(⊖)→)— 9	Control unit (N8/2) removed	2.5 ± 0.25 Ω ²⁾	(Y22/3) Plug connection (X26/7) Wiring
	3.2 Wiring	N8/2 Y22/3 9 —(←(⊖)→)— 1 5 —(←(⊖)→)— 2	Control unit (N8/2) and coupling at (Y22/3) dis- connected	< 1 Ω	Wiring Plug connection (X26/7)
9	4.0 ARA control unit (N8/2)	-	-	-	Control unit (N8/2)

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 %)

b) Testing individual components, engine 606.910

Fault code	Test step/ Test scope	Tester/ Test connection	Operation/ Requirement	Specification	Possible cause/ Remedy
1	1.0	--	--	--	No fault stored
2	2.0 Starter ring gear speed sensor (L3) Voltage	N8/1 10 —(←⊖⊕→)— 12	Control unit (N8/1) removed Engine: Start Idle speed	>3 V~ ¹⁾	(L3), clearance, dirt Plug connection, starter ring gear speed sensor (L3x1)
	2.1 Resistance	N8/1 10 —(←⊖⊕→)— 12	Control unit (N8/1) removed	Beru 527 Ω ²⁾ ± 10 % VDO 1900 Ω ²⁾ ± 10 % AB-Elektronik 1040 Ω ²⁾ ± 10%	(L3) Plug connection, starter ring gear speed sensor (L3x1) Wiring
	2.2 Wiring	N8/1 L3x1 10 —(←⊖⊕→)— 2 12 —(←⊖⊕→)— 1	Control unit (N8/1) removed Plug connection (L3x1) separated	< 1 Ω < 1 Ω	
5 or 7	3.0 ARA actuator (Y22/3) Voltage supply	Y22/3 1 —(←⊖⊕→)— 2	Control unit (N8/1) installed Engine: Start Idle speed Blip throttle briefly	< 1V Voltage rises	Control unit (N8/1) Overvoltage protection relay (K1/2) Wiring
	3.1 Voltage supply	N8/1 9 —(←⊖⊕→)— 11	Control unit (N8/1) removed Ignition: On	11-14 V	Overvoltage protection relay (K1/2) Wiring
	3.2 Resistance	N8/1 5 —(←⊖⊕→)— 9	Control unit (N8/1) removed	2.5 ± 0.25 Ω ²⁾	(Y22/3) Plug connection (X26/7) 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, engine 606.910

Fault code	Test step/ Test scope	Tester/ Test connection	Operation/ Requirement	Specification	Possible cause/ Remedy
	3.3 Wiring	N8/1 9 —← ⊗ —→ 2 5 —← ⊗ —→ 1	Control unit (N8/1) and coupling at (Y22/3) disconnected	< 1 Ω	Plug connection (X26/7)
9	4.0 ELR-ARA control unit (N8/1)	—	—	—	Control unit (N8/1)