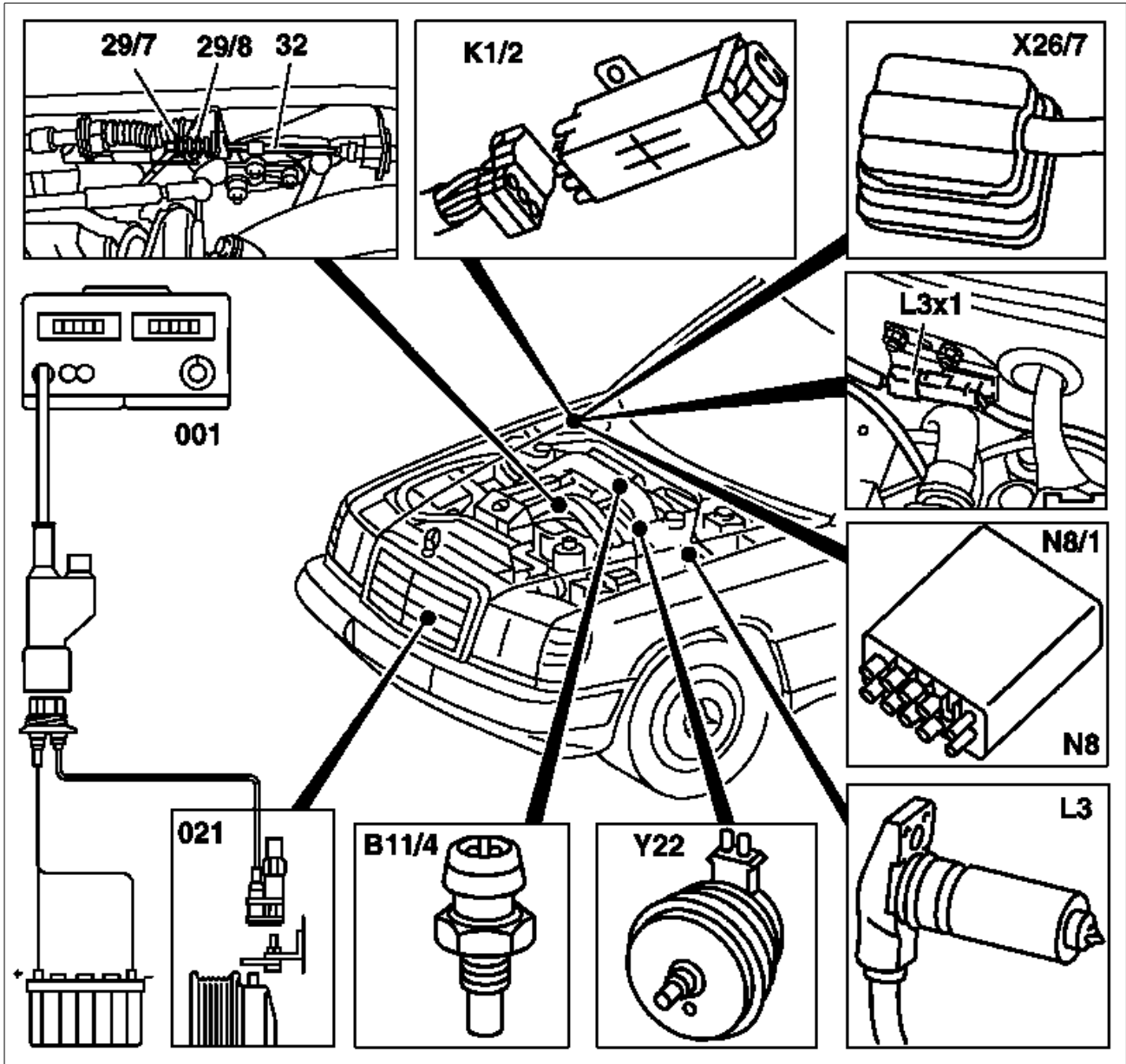
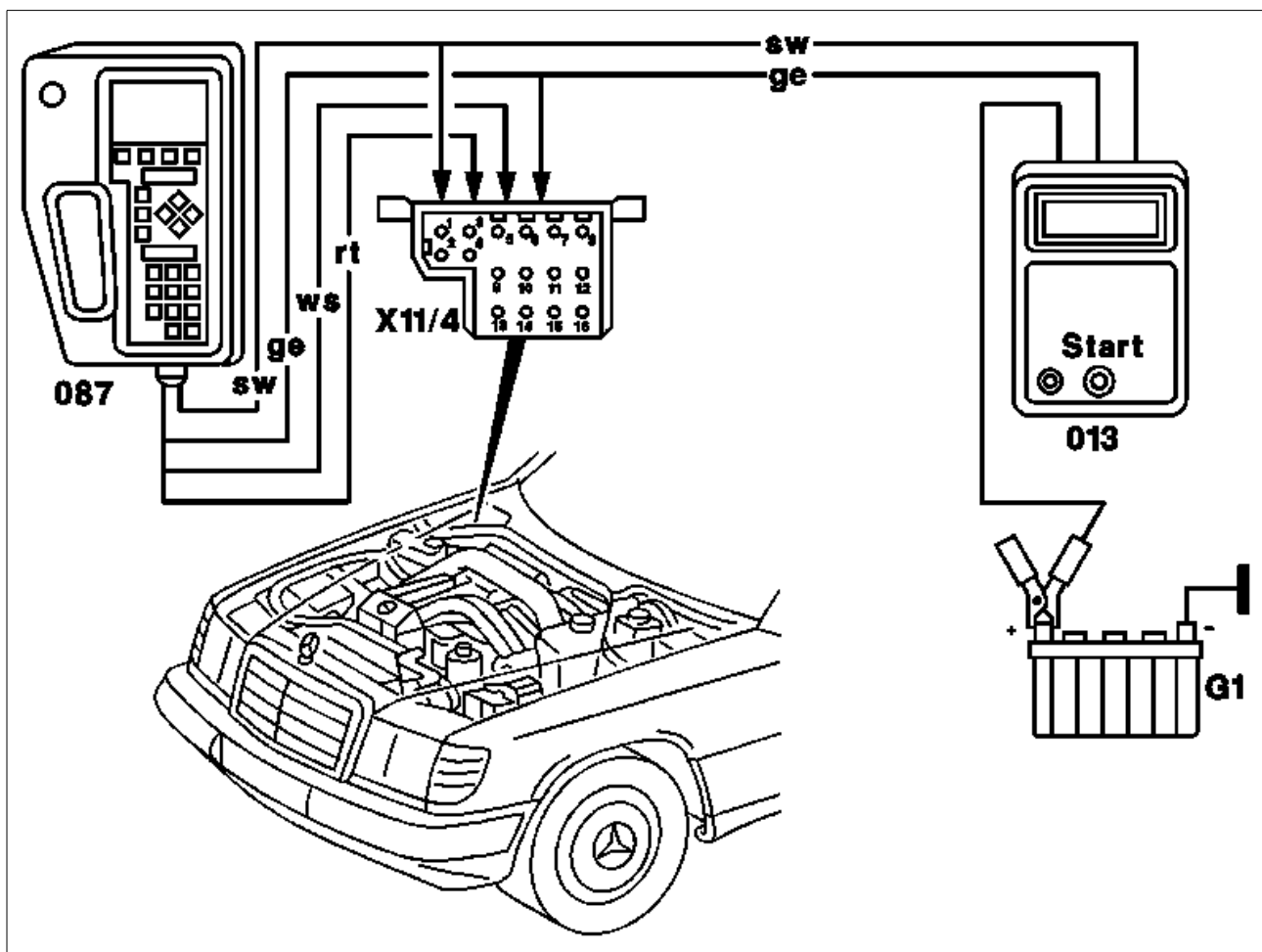


Engine 606.910



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

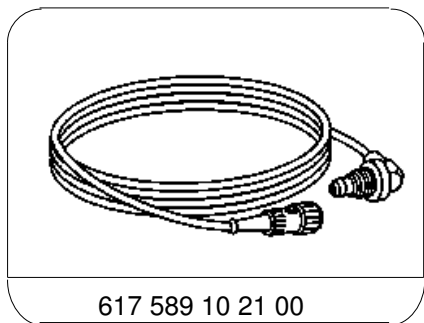
Black cable Terminal 31 (ground) or contact 1
 White cable Terminal 15 (ignition) or contact 16
 Red cable Terminal 30 (battery), X4/10 (terminal block) or contact 3
 Yellow cable Contact 4 (ARA, ELR/ARA control unit)

Enlarged fault memory

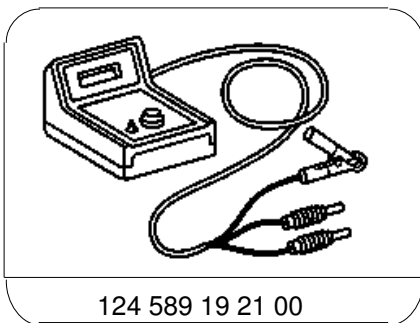
| Fault code | Possible cause |
|------------|--|
| 1 | No fault stored |
| 2 | Speed sensor (L3) |
| 3 | ELR temperature sensor (B11/4) |
| 6 | ELR actuator (Y22), ELR control loop "short circuit" |

| | |
|--|---|
| 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: 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 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" | rectify. |
| Fault memory | 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. |

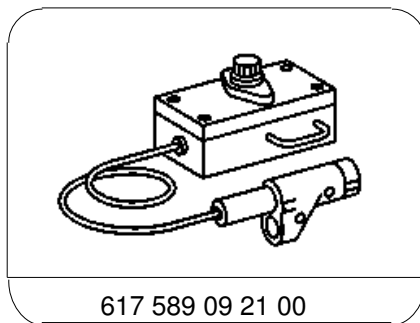
Special tools



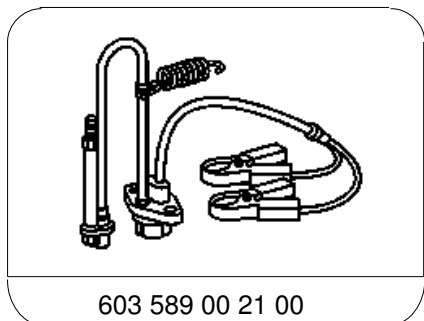
617 589 10 21 00



124 589 19 21 00



617 589 09 21 00



603 589 00 21 00

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 —(←⊖⊕→) — 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 —(←⊖⊕→) — 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 —(←⊖⊕→) —2 12 —(←⊖⊕→) —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 —(←⊖⊕→) — 11 | Control unit (N8-N8/1) removed | °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 |

| | | | | | |
|-----------|---|---|--|--------------------------|--|
| | 3.1 Wiring | N8-N8/1 B11/4 8 —(—(⊖ ⊕)— 2 11 —(—(⊖ ⊕)— 4 | Control unit (N8-N8/1) removed Plug connection (B11/4) disconnected | <1 Ω | Plug connection (X26/7) |
| Б or В | 4.0 ELR actuator (Y22) | X26/7 7 —(—(⊖ ⊕)— 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 —(—(⊖ ⊕)— 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 —(—(⊖ ⊕)— 1 9 —(—(⊖ ⊕)— 2 | Control unit (N8-N8/1) and coupling at (Y22) disconnected | <1 Ω | Plug connection (X26/7) |
| Г | 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 %)