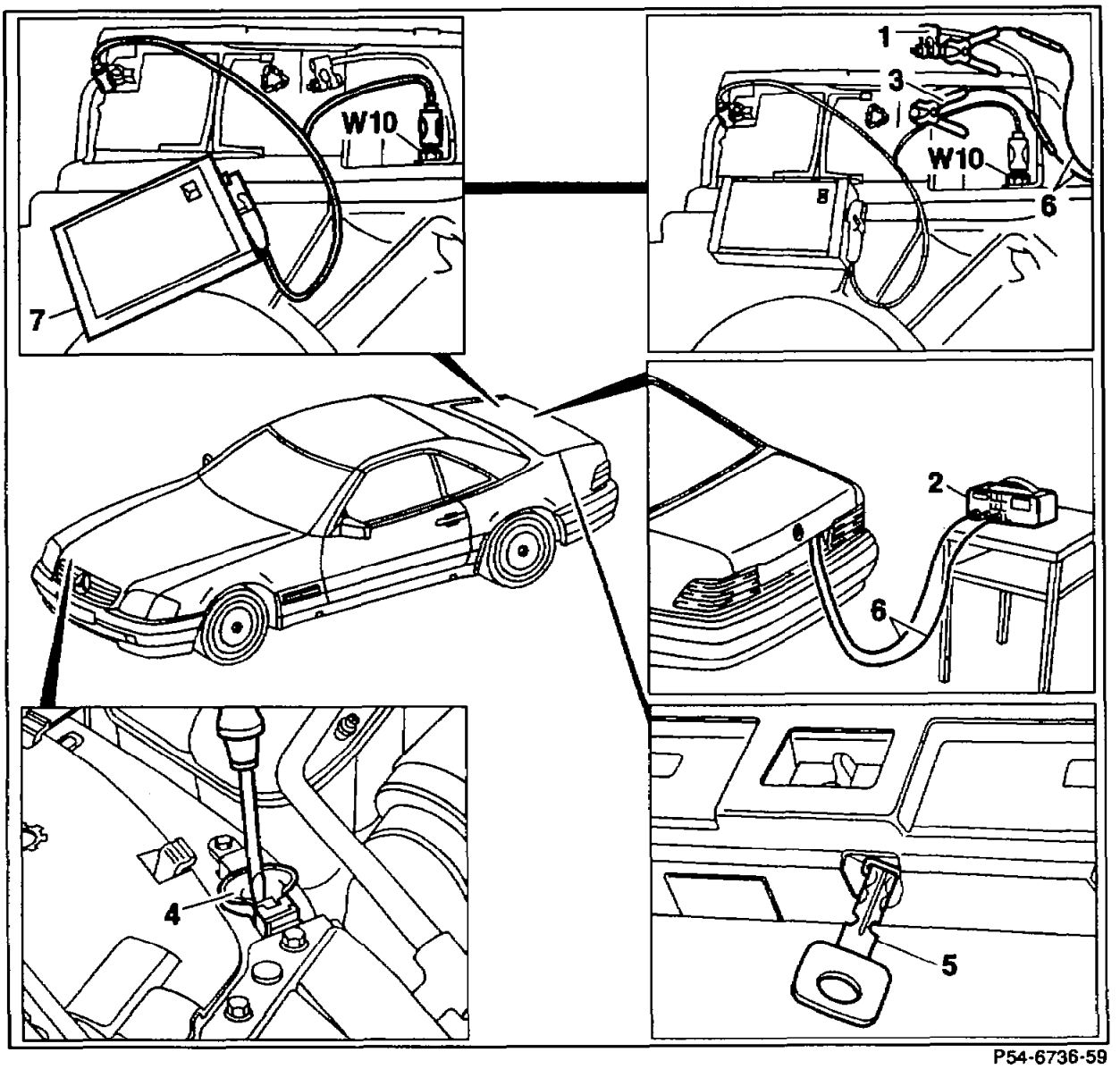
54–1030 Testing no-load current consumption

Preceding work:
Testing battery charge state.
All assemblies and equipment in the vehicle operating properly.

A. Testing total no-load current consumption



P54-6736-59

Shown on model 129

The test on model 124 is carried out in the same way as in model 129

1	Ground cable	5	Key for operating microswitch at inner trunk lock
2	Multimeter	6	Test cable
3	Negative terminal of battery	7	No-load current retention equipment
4	Right hood lock	W10	Battery ground

Preparing test

Side windows of front doors	open.
All electrical components	switch off e.g.: • remove ignition key, • switch off auxiliary heater, • switch off car phone, • switch off radio, • fold make-up mirror closed, • switch off reading lights, • turn light switch to position "0", • close doors, interior lighting should go off automatically after a few seconds.
	⚠ Pay attention to limit value of multimeter for current measurements. When central locking pump operates, a current of approx. **20 A** flows.

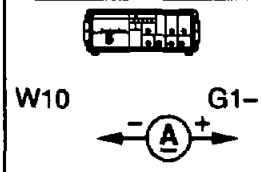
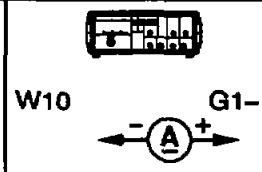
Preparing test with no-load current retention equipment

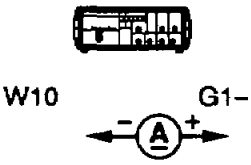
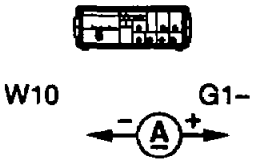
No-load current retention equipment (7)	connect as follows: Ground cable (–) to battery ground (W10). Positive cable (+) to positive terminal of battery.
No-load current retention equipment (7)	switch on.
Ground cable (1) at battery	disconnect.
Multimeter (2)	connect as follows; use "electrical connection set" (201 589 00 99 00) for this step. Positive cable (+) to battery ground terminal. Negative cable (–) to negative terminal of battery (3).
Multimeter (2)	switch on (Amperes range).
No-load current retention equipment (7)	switch off and disconnect.
Test cables (6)	run to the right out of engine compartment.
	Note On model 124.034/ .036 run the test cables to the right out of the trunk.
Hood	close.
	Note On model 124.034/ .036 close trunk lid.

Preparing test without no-load current retention equipment

Nut of ground terminal	slacken.
	⚠ Do not pull off ground terminal!
Multimeter (2)	switch on (Amperes range).
Multimeter (2)	connect as follows; use "electrical connection set" (201 589 00 99 00) for this step. Positive cable (+) to battery ground (W10). Negative cable (–) to negative terminal of battery (3).
Ground cable (1) at negative terminal of battery (3)	pull off carefully.
	⚠ Do not interrupt circuit otherwise any faults whic exist are erased.
Mulitmeter (2) with test cables (6)	run to the right out of engine compartment.
	Note On model 124.034/ .036 run the test cables to the right out of the trunk.
Hood	close, lock should engage.
	Note On model 124.034/ .036 close trunk lid.

Test

Test step	Test procedure	Tester/ test connection	Operation/ requirement	Specification	Possible cause/ remedy
1	No-load current		• Lock car • Wait about 4 minutes (run-on time for electrical components)	**No-load current** ≤0.05 A (50 mA) or ≤0.085 A (85 mA) models with immobilizer	**Readout ≤0.05 A, or ≤0.085 A** (models with immobilizer) • Carry out test step 2 **Readout >0.05 A, or >0.085 A** (models with immobilizer) • Carry out test step 3
2	No-load current		• Unlock car • Wait about 4 minutes (run-on time for electrical components)	**No-load current** ≤0.05 A (50 mA) or ≤0.085 A (85 mA) models with immobilizer	**Readout ≤0.05 A, or ≤0.085 A** (models with immobilizer) • End of test **Readout >0.05 A, or >0.085 A** (models with immobilizer) • Carry out test step 4

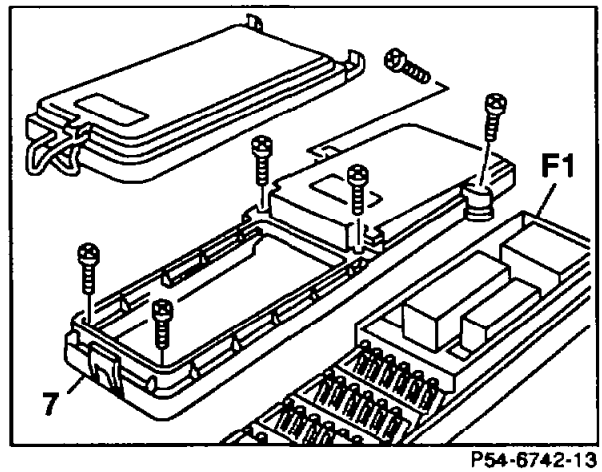
Test step	Test procedure	Tester/ test connection	Operation/ requirement	Specification	Possible cause/ remedy
3	No-load current		• Unlock car • Wait about 4 minutes (run-on time for electrical components)	**No-load current** ≤ 0.05 A (50 mA) or ≤ 0.085 A (85 mA) models with immobilizer	**Readout ≤0.05 A, or ≤0.085 A** (models with immobilizer) • Note readout • Then, carry out section B **Readout >0,05 A, or >0,085 A** (models with immobilizer) • Carry out test 4
4	No-load current		• Open trunk lid • Operate microswitch at trunk lock (5) • Wait about 4 minutes (run-on time for electrical components)	**No-load current** ≤ 0.05 A (50 mA) or ≤ 0.085 A (85 mA) models with immobilizer	**Readout ≤0.05 A, or ≤0.085 A** (models with immobilizer) • Set switch at trunk lock, replace if necessary (trunk lighting) • As a check, once again carry out test step 1 **Readout >0.05 A, or >0.085 A** (models with immobilizer) • Note readout • Then, carry out section B

B. Determining circuit with increased no-load current consumption

Preceding work:
Total no-load current consumption tested (section A).

Preparing test

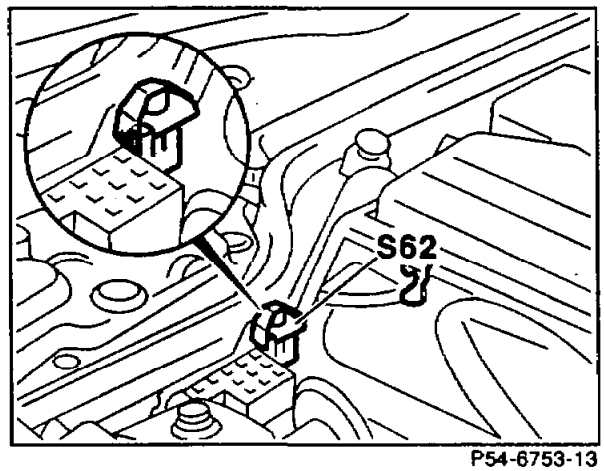
Open fuse and relay box (F1) and take off cover (7).



P54-6742-13

Note
When dealing with the problem of increased no-load current when car locked (section A, test step 3), carry out the following points in addition:

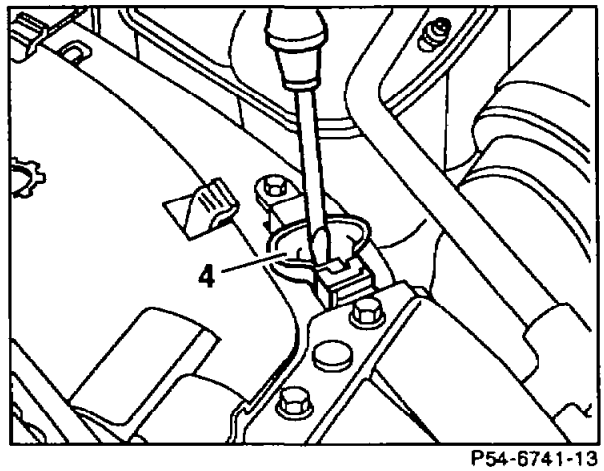
- On models with ATA:
  Hold right hood switch (S62) pressed with insulating tape or lock right hood lock (4) with a screwdriver.



P54-6753-13

Switch on interior motion sensor, if fitted.

- Lock car.

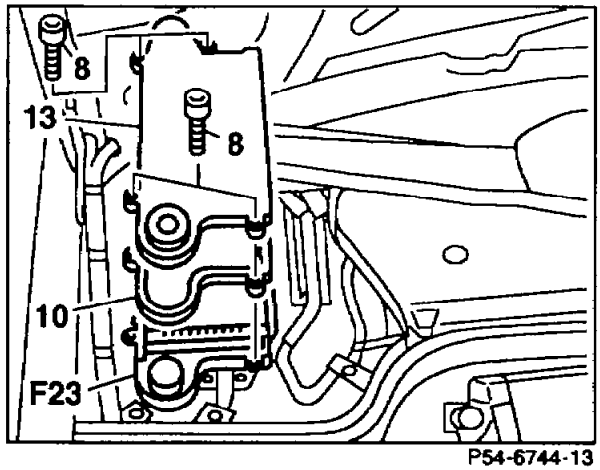


P54-6741-13

Models with module box (model 124.034/ .036) (F23)
Remove cover (13) at module box (F23).

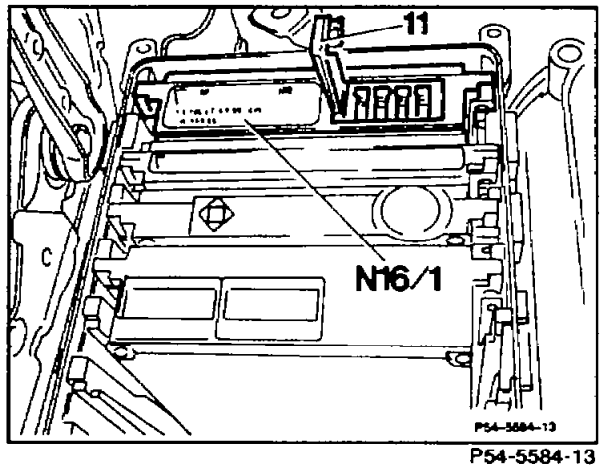
Inspect gasket (10) for signs of damage, replace if necessary.

When the installing the cover (13) ensure the gasket (10) is correctly located.



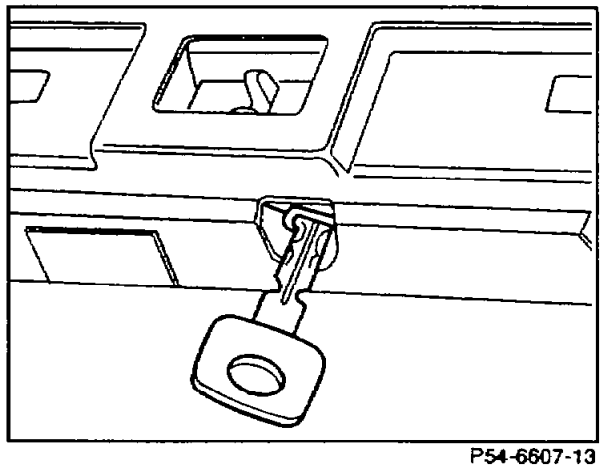
P54-6744-13

Open cover (11) at base module (N16/1).



P54-5584-13

Note
In order to avoid incorrect measurements, the switch at the trunk lock has to be operated when the trunk lid is open or, if the switch is missing, the bulbs of the trunk lighting on the left and right have to be removed.


P54-6607-13

Test step 1

⚠

Pay attention to up-to-date information (AI).
First of all check circuits of components which are listed in the up-to-date information.

Fuse ..... remove.

Note

Remove fuses for the ATA only if car is unlocked (alarm signal).

No-load current ..... read off on multimeter (2), connected to battery, and compare with noted figure.

If total no-load current drops <0.02 A (20 mA):

Fuse ..... re-insert.

- Carry out test in the same way with all fuses in the fuse boxes and in the base module. Wait 5 seconds between each individual test.

Note

After inserting a fuse, the connected components may briefly indicate an increased no-load current. The radio by as much as 0.240 A (240 mA).
The increased no-load current consumption is eliminated by switching the radio on and off.

If no fault is found during these tests ..... carry out section D.

If total no-load current drops >0.02 A (20 mA):

Replace the component listed in the up-to-date information or carry out section C, respectively.

Note

After replacing the component listed in the up-to-date information, once again test total no-load current consumption (section A).

- On models with ATA, unlock hood lock on right or remove insulating tape from hood switch (S62).

If total no-load current increases >0.02 A (20 mA):
Cause return current along a different current path, *carry out test step 2.*

Test step 2

Test cables (6) and, as need be, test adapter . . . connect to a second multimeter, switch on (Amperes range).

Faulty fuse (from test step 1 models up to approx. 08/95) . . . . . remove.

Multimeter . . . . . connect to fuse carrier and read off no-load current after 5 seconds.

No-load current ≤0.02 A (20 mA):
- The protected circuit is o.k.
- Re-insert fuse, wait 5 seconds and test all further fuses as specified in test step 1.

Note
After inserting a fuse, the connected components may briefly indicate an increased no-load current. The radio by as much as 0.240 A (240 mA).
The increased no-load current consumption is eliminated by switching the radio on and off.

No-load current >0.02 A (20 mA):
- Determine the protected components with an increased no-load current consumption (section C).

C. Determining protected components with increased no-load current consumption

Preceding work:
Total no-load current consumption tested (section A).
Circuit with the increased no-load current consumption determined (section B).

Test cables (6) and, as need be, test adapter ... connect to a second multimeter, switch on (Amperes range).

Multimeter ..... connect to faulty fuse.

Possible no-load current consumer at fault fuse ..... determine according to fuse box insertion sheet or wiring diagram file "Wiring Diagrams Passenger Cars" and unplug connector.

No-load current ..... read off at second multimeter.

No-load current >0.02 A (20 mA):

- Component is o.k., plug in connector again at the tested component.
- Carry out test in the same way with all the possible components at the faulty fuse.

Note

If a measurement is made at the fuse carrier of the radio or if the connector of the radio is unplugged, the no-load current may rise by approx. 0.240 A (240 mA).
The increased no-load current is eliminated by switching the radio on and off.

No-load current ≤0.02 A (20 mA):

- Replace component.

Total no-load current ..... test once again at multimeter (2) which is connected to the battery.

Readout ≤0.05 A (50 mA) or ≤0.085 A (85 mA) models with immobilizer

- End of test.

⚠

On models with ATA unlock hood lock on right or remove insulating tape from hood switch (S62).

Readout >0.05 A (50 mA) or >0.085 A (85 mA) models with immobilizer

- After this determine no-load current consumption at the next untested fuses (section B).

D. Determining unprotected components with increased no-load current consumption

Preceding work:
Total no-load current consumption tested (section A).
Circuit with the increased no-load current consumption determined (section B).

Unprotected components	are e.g.: • Components of exhaust gas recirculation system (EGR) • Components of airbag system (AB) • Components of knock control system (KSS) • Components of electronic ignition system (DI) • Base module (BM) • Anti-theft systems e.g. immobilizer • Components of idle speed control (ISC) system • Generator, starter ignition switch Unprotected components see "Wiring Diagrams".
Multimeter (2)	disconnect at negative terminal of battery (3).
Coupling or connection at possible no-load current consumer	separate and tie back to ensure no contact (determine connector or connection in wiring folder "Wiring Diagrams Passenger Cars".
Multimeter (2)	connect to negative terminal of battery (3) and wati about 4 minutes (run-on time for electronic components). **Note** The no-load current consumption may rise as a result of the radio by approx. 0.240 A (240 mA). The increased no-load current consumption is eliminated by switching the radio on and off.

Read off no-load current on multimeter (2) and compare with noted figure . . . . . .

If total no-load current drops ≤0.02 A (20 mA) or ≤0.035 A (35 mA) in the case of a immobilizer control module:

- Component is o.k.
- Disconnect multimeter (2) at negative terminal of battery (3)
- Plug in connector or connection again at the component
- Repeat test with all possible no-load current consumers as described

If total no-load current drops >0.02 A (20 mA) or >0.035 A (35 mA) in the case of a immobilizer control module:

- Replace component

Test total no-load current at multimeter (2) . . . . .

Readout ≤0.05 A (50 mA) or ≤0.085 A (85 mA) models with immobilizer

- End of test.

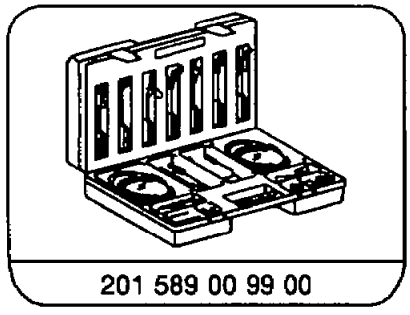
⚠

- On models with ATA unlock hood lock on right or remove insulating tape from hood switch (S62)

Readout >0.05 A (50 mA) or >0.085 A (85 mA models with immobilizer)

- Carry out test with unprotected no-load current consumers not yet tested, as described

Special tools



201 589 00 99 00

Commercially available tools and testers, MB testers (see Workshop Equipment Manual)

Designation	E.g. make, order no.
Multimeter	Sun DMM-5 Fluke, 88
No-load current retention equipment	Hans Zeheter CMP 12.2