11.5 Model 208

Diagnosis – Function Test

⚠ **WARNING: Risk of Personal Injury!**

MOVING COMPONENTS

When working on components which are moved by hand, by electric motor, by hydraulic or pneumatic means via a connecting mechanism, severe injury may be sustained as a result of severing, trapping or crushing of limbs.

During work in the area of the roll bar, there is a risk of serious injury should the roll bar suddenly deploy.
Extend the roll bar before working in the roll bar area. Keep parts of your body away from the range of travel of roll bar mechanism.

Refer to Hydraulic Test Program, 33/4; for additional important safety warnings and precautions.

HYDRAULIC SYSTEMS

Serious injuries can be caused to the skin or eyes from high pressure hydraulic fluid spray.
Before perfoming work on hydraulic system, depressurize the system and wear protective clothing and safety glasses.

Refer to Hydraulic Test Program, 33/4; for additional important safety warnings and precautions.

PREREQUISITS FOR PERFORMING FUNCTION TEST:

Battery voltage 11-14 V.
Fuses OK.

Diagnosis – Function Test

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy [1]
⇒ 1.0 Opening soft top with power soft top switch (S84)	Ignition: **ON** Soft top: **CLOSED** Soft top cover in trunk: **ATTACHED** Trunk lid: **CLOSED,**	**Note:** If S84 is released, the soft top opening process is interrupted immediately (stop operation). All side windows move down	13
	Unlock soft top manually Press power soft top switch (S84) towards "OPEN SOFT TOP" and keep pressed.	The indicator lamp in S84 comes on, the rollover bar is lowered. The indicator lamp in soft top switch comes on until the soft top compartment cover is locked. If the rollover bar was extended before the power soft top was operated, then it is extended again automatically after the soft top is opened (to do this, keep the S84 switch operated). Once the opening process is complete an acoustic signal from the roof control unit control module (N70) sounds for 1 second.	

[1] Observe Preparation for Test, see 22.

Diagnosis – Function Test

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy [1]
⇒ 2.0 Closing soft top with power soft top switch (S84)	Soft top: **CLOSED** Soft top cover in trunk: **ATTACHED** Trunk lid: **CLOSED** Ignition: **ON** Press power soft top switch (S84) towards "CLOSE SOFT TOP" and keep pressed.	**Note:** If S84 is released, the soft top opening process is interrupted immediately (stop operation). The indicator lamp in S84 comes on starting when the operating button is pressed until the soft top is locked (manually). All side windows move down. If the rollover bar is extended before the soft top is closed, it is lowered during the soft top closing process. Once the automatic closing process is complete, e.g. before manual locking, an acoustic signal from the roof control unit control module (N70) sounds for 1 second.	⇒13
⇒ 3.0 Acoustic warning signal in the roof control unit control module (N70)	Soft top or soft top compartment cover: **UNLOCKED** When vehicle starts to move:	An acoustic warning signal from the roof control unit control module (N70) sounds for 10 seconds.	⇒13

[1] Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

⚠ **WARNING: Risk of Personal Injury!**

MOVING COMPONENTS

When working on components which are moved by hand, by electric motor, by hydraulic or pneumatic means via a connecting mechanism, severe injury may be sustained as a result of severing, trapping or crushing of limbs.

During work in the area of the roll bar, there is a risk of serious injury should the roll bar suddenly deploy.
Extend the roll bar before working in the rollbar area. Keep parts of your body away from the range of travel of roll bar mechanism.

Refer to Hydraulic Test Program, 33/4; for additional important safety warnings and precautions.

Prerequisite for reading DTC memory

1. Fuses OK.
2. Battery voltage > 11 V.
3. Connect HHT according to connection diagram, see section 0.

Note:
The DTC's, actuations and actual values can be found under HHT menu for roll bar/soft top control module.
The electronic ignition-starter switch (N73) serves as an interface (gateway) between the roll bar (RB) control module (power soft top) (N52) and the Hand-Held Tester (HHT).

Note regarding DTCs

Current diagnostic trouble codes are high lighted in black on the display. Additional detailed fault information based on fault type is displayed with nearly all diagnostic codes (DTC's) such as:

> Ω resistance too great
< Ω resistance too low
⌜⌝+ short circuit to positive (POS)
⌜⌝– short circuit to ground (GND)
–//– open circuit

Diagnosis – Diagnostic Trouble Code (DTC) Memory

Preliminary work:
Diagnosis - Function Test 11

DTC 	Possible cause	Note	Test step/Remedy [1]
B1000	Fault in roll bar (RB) control module (power soft top) (N52)		23 ⇒ 1
B1010	Voltage, terminal 30 is less than 10 V	Voltage is checked via the CAN data bus	Read out actual value
B1122	Left rear power window switch (N72s3) operated for more than 25 seconds	The switch N72s3 is read in by the lower control field control module (N72)	Diagnostic Manual Body and Accessories Volume 2, Section 5.4, 23
B1123	Right rear power window switch (N72s4) operated for more than 25 seconds	The switch N72s4 is read in by the lower control field control module (N72)	Diagnostic Manual Body and Accessories Volume 2, Section 5.4, 23
B1644 00	Temperature of hydraulic unit motor (A7/5m1) is higher than 85°C		23 ⇒ 7
B1644 01	Temperature of hydraulic unit motor (A7/5m1) is higher than 120°C		23 ⇒ 7

[1] Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC	Possible cause	Note	Test step/Remedy [1]
B1644 02	Substantial temperature rise of hydraulic unit motor (A7/5m1).	The fault code is set: Temperature at A7/5 — Increase in temperature 40 °C to 50 °C — > 4 °C per sec. or 50 °C to 90°C — > 2 °C per sec.	23 ⇒ 7
B1644 03	Resistance of temperature sensor of roll bar (RB) hydraulic unit (power soft top) (A7/5) implausible (>180°C), short-circuit to ground.	The fault code is set if the temperature of the hydraulic unit motor (A7/5m1) is higher than 180 °C.	23 ⇒ 7
B1644 04	Resistance of temperature sensor of roll bar (RB) hydraulic unit (power soft top) (A7/5) implausible, wire open-circuit.	The fault code is set if the temperature of the hydraulic unit motor (A7/5m1) remains lower than 15°C also after operating the power soft top switch (S84) for 8 seconds.	23 ⇒ 7
B1645 00	Power soft top switch (S84) operated for more than 250 seconds.		23 ⇒ 3
B1646 00	RB switch (manual operation) (S83) operated for more than 25 seconds.		23 ⇒ 20

[1] Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC	Possible cause	Note	Test step/Remedy [1]
B1647 10	Current in roll bar (RB) valve block rod side valve (Y57y10) too high or too low.	The fault is recognized by the evaluation of a test current pulse from roll bar (RB) control module (power soft top) (N52).	Wiring Y57y10
B1647 11	Current in RB valve block piston side valve (Y57y11) too high or too low.	The fault is recognized by the evaluation of a test current pulse from N52.	Wiring Y57y11
B1647 12	Current in power soft top compartment cover lock "open" (Y56/2y7) too high or too low.	The fault is recognized by the evaluation of a test current pulse from N52.	Wiring Y56/2y7
B1647 13	Current in fabric bow lock "open" (Y56/2y6) too high or too low.	The fault is recognized by the evaluation of a test current pulse from N52.	Wiring Y56/2y6
B1647 14	Current in fabric bow "open" (Y56/2y3) too high or too low.	The fault is recognized by the evaluation of a test current pulse from N52.	Wiring Y56/2y3
B1647 15	Current in soft top bow "closed" (Y56/2y4) too high or too low	The fault is recognized by the evaluation of a test current pulse from N52.	Wiring Y56/2y4
B1647 16	Current in soft top "closed" valve block (Y56/2y2) too high or too low	The fault is recognized by the evaluation of a test current pulse from N52.	Wiring Y56/2y2

[1] Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC	Possible cause	Note	Test step/Remedy [1]
B1647 17	Current in soft top "open" valve block (Y56/2y1) too high or too low	The fault is recognized by the evaluation of a test current pulse from N52.	Wiring Y56/2y1
B1647 18	Current in power top compartment cover "open" valve block (Y56/2y5) too high or too low	The fault is recognized by the evaluation of a test current pulse from N52.	Wiring Y56/2y5
B1647 19	Current in left rear power window motor (M10/5) too high or too low		Wiring M10/5
B1647 20	Current in right rear power window motor (M10/6) too high or too low		Wiring M10/6
B1648	Wiring, RB deployment solenoid (Y57/1)		23 ⇒ 19

[1] Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC 	Possible cause	Note	Test step/Remedy [1]
B1650	The positions of the limit switches do not correspond to the function sequence or are unknown. The status of a limit switch is not plausible.		23 ⇒ 17 23 ⇒ 18 23 ⇒ 8 23 ⇒ 9 23 ⇒ 10 23 ⇒ 11 23 ⇒ 12 23 ⇒ 13 23 ⇒ 14 23 ⇒ 15 23 ⇒ 16
B1650 00	The maximum permissible time until the roll bar (RB) retracted limit switch (S83/5) is triggered has been exceeded.		23 ⇒ 17
B1650 01	The maximum permissible time until the RB extended limit switch (S83/6) is triggered has been exceeded.		23 ⇒ 18
B1650 02	The maximum permissible time until the soft top locked (left) limit switch (S84/11) is triggered has been exceeded.		23 ⇒ 9

[1] Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC	Possible cause	Note	Test step/Remedy [1]
B1650 04	The maximum permissible time until the soft top open limit switch (S84/13s2) is triggered has been exceeded.		23 ⇒ 10
B1650 05	The maximum permissible time until the soft top close limit switch (S84/13s1) is triggered has been exceeded.		23 ⇒ 11
B1650 06	The maximum permissible time until the soft top compartment "open" limit switch (S84/5) is triggered has been exceeded.		23 ⇒ 12
B1650 07	The maximum permissible time until the cover "closed" switch (A25s1) is triggered has been exceeded.		23 ⇒ 13
B1650 08	The maximum permissible time until the cover "locked" switch (A25s2) is triggered has been exceeded.		23 ⇒ 14

[1] Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC	Possible cause	Note	Test step/Remedy [1]
B1650 09	The maximum permissible time until the soft top fabric bow down/up limit switch (S84/15), in "up" position is triggered has been exceeded.		23 ⇒ 15
B1650 10	The maximum permissible time until the soft top fabric bow down/up limit switch (S84/15), in "down" position is triggered has been exceeded.		23 ⇒ 15
B1650 11	The maximum permissible time until the soft top bow locked limit switch (S84/16) is triggered has been exceeded.		23 ⇒ 16
B1650 12	The maximum permissible time until the retractable luggage cover engaged limit switch (S69/10) is triggered has been exceeded.		23 ⇒ 8

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

⚠ **WARNING: Risk of Personal Injury!**

MOVING COMPONENTS

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During work in the area of the roll bar, there is a risk of serious injury should the roll bar suddenly deploy.

Extend the rollbar before working in the rollbar area. Keep parts of your body away from the range of travel of roll bar mechanism.

Refer to Hydraulic Test Program, 33/4; for additional important safety warnings and precautions.

Diagnosis – Complaint Related Diagnostic Chart

Reveiw entire complaint related diagnostic chart; more than complaint/problem (column 1) may apply. Take into consideration all possible test steps/remedies (column 4).

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
No communication between the Hand-Held Tester (HHT) and the roll (RB)control module (power soft top) (N52) possible.	Voltage supply, CAN data bus, HHT interface (K-line at electronic ignition switch control module [N73])		23⇒ 1 23⇒ 2
Acoustic warning signal of roof control unit control module (N70) when vehicle is driven and the power soft top switch (S84) is not operated.	The soft top is not locked properly.	The output duration of the warning signal is approx. 10 seconds. Reset condition for a renewed output of a warning signal: • Ignition OFF/ON or • Change of a limit switch status	Lock soft top

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
No acoustic warning signal of overhead control panel control module (N70).	CAN data bus, roll (RB)control module (power soft top)(N52), soft top operation locking gong (N70h1).		Check HHT actuation of N70h1
Flashing of indicator lamp in power soft top switch (S84) when the switch is operated with the vehicle driven or stationary.	Soft top is not locked properly (flashing frequency = 1 Hz).	⚠ **CAUTION!** The soft top must never be opened or closed while driving!	Lock soft top.
Flashing of indicator lamp in power soft top switch (S84) when the switch is operated with the vehicle stationary.	Soft top is still locked before opening (flashing frequency = 1 Hz). Trunk luggage cover not closed (flashing frequency = 3 Hz), Trunk luggage cover closed limit switch (S69/10) The trunk lid is open (flashing frequency = 3 Hz), Rotary tumbler switch, CAN interior bus, PSE control module (combined) (A37) Fault in soft top system (flashing frequency = 1 Hz).	 The trunk luggage cover must be pulled out each time before the soft top is operated.	Unlock soft top. Pull out trunk luggage cover. 23⇒ 8 Close trunk lid. Read out pneumatic system equipment (PSE) diagnostic trouble code (DTC) memory.

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Indicator lamp in power soft top switch (S84) permanently illuminated with the vehicle stationary, and S84 is not operated. ⚠ **WARNING!** If the indicator lamp in S84 is permanently illuminated the roll bar must be extended manually with the roll bar (RB) switch (manual operation) (S83) before driving the vehicle for reasons of safety.	Soft top or soft top compartment cover is not locked properly Wiring or fuse, terminal 30 Defective or wiring open-circuit at: Power soft top switch (S84), RB "retracted" switch (S83/5), RB "extended" switch (S83/6)	As a function check the indicator lamp must come on for 1 second after the ignition is switched on.	Read out the HHT actual values to check locking. 23⇒ 3 23⇒ 17 23⇒ 18
Soft top does not function when power soft top switch (S84) is operated	No vehicle speed signal CAN data bus Voltage supply Power soft top switch (S84) Roll bar (RB) hydraulic unit (power soft top) (A7/5)	Signal comes via CAN data bus. The soft top can only be operated if: V=0 km/h	Read out HHT actual value. 23⇒ 2 23⇒ 1 23⇒ 3 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Soft top does not open or close completely	Undervoltage when there is a load on the vehicle battery (G1) Overheating of hydraulic unit motor (A7/5m1).		23⇒ 1 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Faults during "close soft top" movement sequence			
Soft top compartment cover lock does not open	No vehicle speed signal. Voltage supply to roll (RB)control module (power soft top) (N52) and RB hydraulic unit (power soft top) A7/5 RB "retracted" switch (S83/5), RB "extended" switch (S83/6), soft top locked left limit switch (S84/11), power soft top switch (S84), Power top compartment cover lock "open" valve (Y56/2y7) Internal leaks at hydraulic cylinder, unlock/lock soft top compartment cover or at hydraulic cylinder, unlock/lock soft top bow Roll(RB)/soft top operation hydraulic unit (A7/5)	Signal comes via CAN data bus. The soft top can only be operated if: v=0 km/h	Read out actual values using HHT. 23⇒ 1 23⇒ 2 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Soft top compartment cover does not open or only raises slowly	Voltage supply to roll (RB)control module (power soft top) (N52) and RB hydraulic unit (power soft top) A7/5 Hydraulic cylinder, power top compartment cover lock "open" (Y56/2y7), power top compartment cover "open" (Y56/2y5), hydraulic cylinder, unlock/lock soft top compartment cover hydraulic cylinder, open/close soft top compartment cover		23⇒ 1 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Soft top does not come out of soft top compartment or only closes slowly	Soft top compartment "open" switch (S84/5), power top compartment cover "open" (Y56/2y5), hydraulic cylinder, open/close soft top		23⇒ 1 23⇒ 12 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Soft top bow does not unlock	Soft top opened limit switch (S84/13s2), soft top bow lock "open" valve (Y56/2y6), hydraulic cylinder, unlock/lock soft top bow		23⇒ 10 23⇒ 1 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Soft top bow does not raise or only raises slowly	Soft top bow locked limit switch (S84/16), soft top bow "raise" valve (Y55y8), hydraulic cylinder, raise/lower soft top bow		23⇒ 16 23⇒ 1 23⇒ 7 23⇒ 5 23⇒ 6 23⇒ 1
Soft top compartment cover does not close or only closes slowly	Soft top bow down/up limit switch (S84/15), fabric bow lock "open" valve (Y56/2y6), power soft top compartment cover "open" (Y56/2y5), hydraulic cylinder, open/close soft top compartment cover.		23⇒ 15 23⇒ 1 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Soft top compartment cover does not lock	Soft top compartment cover limit switch (closed) (A25s1), Power top compartment cover lock "open" (Y56/2y7), hydraulic cylinder, unlock/lock soft top compartment cover		23⇒ 13 23⇒ 1 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Soft top bow does not close or only closes slowly	Soft top compartment cover limit switch (locked) (A25s2), fabric bow "closed" valve (Y56/2y4), hydraulic cylinder, raise/lower soft top bow		23⇒ 14 23⇒ 1 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Soft top bow lock does not lock	Soft top bow down/up limit switch (S84/15), fabric bow lock "open" (Y56/2y6), hydraulic cylinder, unlock/lock soft top bow		23⇒ 15 23⇒ 1 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

1) Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Faults during "open soft top" movement sequence (soft top is unlocked)			
Soft top bow lock does not unlock	No vehicle speed signal Voltage supply to roll bar (RB) control module (power soft top) (N52) and RB hydraulic unit (power soft top) (A7/5) Soft top locked left limit switch (S84/11) RB "retracted" switch (S83/5), power soft top switch (S84) fabric bow lock "open" (Y56/2y6), power top "open" (Y56/2y1) Internal leaks at hydraulic cylinder, unlock/lock soft top bow, hydraulic cylinder, unlock/lock soft top compartment cover or hydraulic cylinder, open/close soft top compartment cover A7/5	Signal comes via CAN data bus. The soft top can only be operated if: v=0 km/h	Read out actual values using HHT. 23⇒ 1 23⇒ 2 23⇒ 9 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Soft top bow does not raise or only raises slowly	Fabric bow locked limit switch (S84/16), fabric bow "open" (Y56/2y3), hydraulic cylinder, raise/lower soft top bow		23⇒ 16 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Soft top compartment cover lock does not unlock	Fabric bow up/down limit switch (S84/15), power top compartment cover lock "open" (Y56/2y7), hydraulic cylinder, unlock/lock soft top compartment cover		23⇒ 15 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Soft top compartment cover does not open or only raises slowly	Soft top compartment limit switch (locked) (A25s2), power top compartment cover "open" valve (Y56/2y5), hydraulic cylinder, open/close soft top compartment cover		23⇒ 14 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Soft top bow does not close or only closes slowly	Soft top compartment "open" switch (S84/5), fabric bow "lower" valve (Y55y9), hydraulic cylinder, raise/lower soft top bow (left and/or right)		23⇒ 12 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Soft top does not open or only raises slowly	Soft top fabric bow up/down limit switch (S84/15), power top "open" (Y56/2y1), hydraulic cylinder, open/close soft top (left or/and right)		23⇒ 15 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1
Soft top compartment cover does not close or only closes slowly	Soft top open limit switch (S84/13s2), fabric bow lock "open" (Y56/2y6), power top compartment cover "open" (Y56/2y5) hydraulic cylinder, open/close soft top compartment cover		23⇒ 10 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

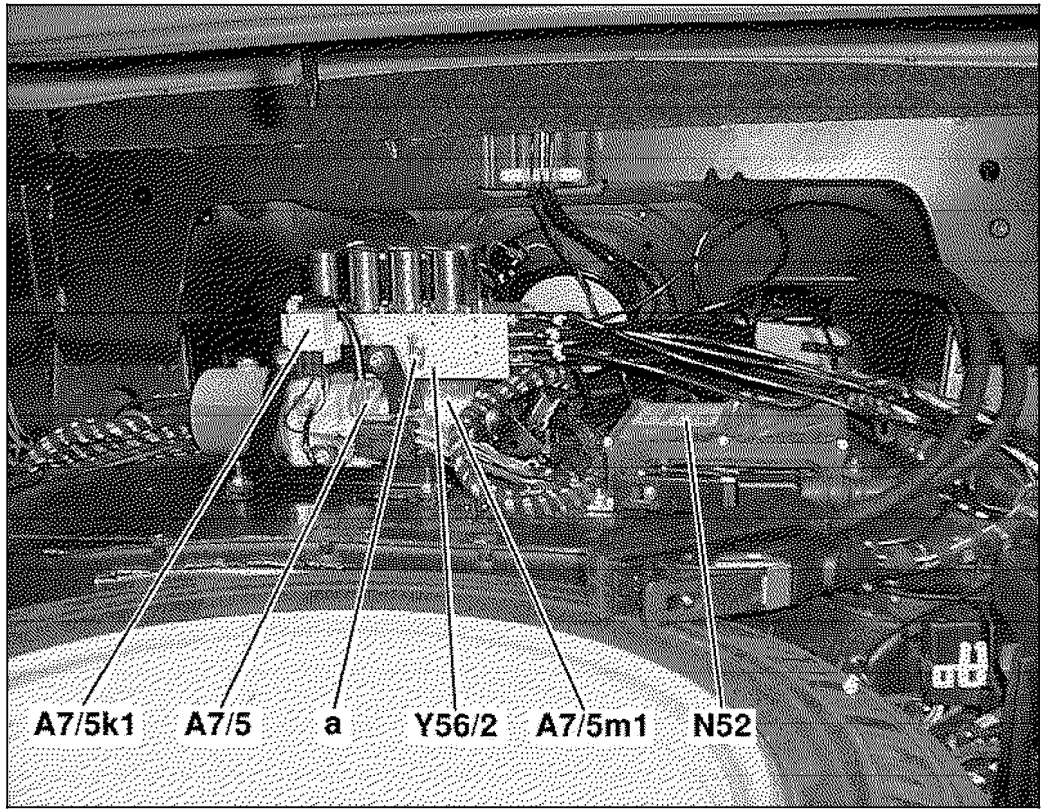
[1] Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Note	Test step/Remedy [1]
Soft top compartment cover lock does not lock	Soft top compartment closed limit switch (A25s1), Power top compartment cover lock "open" (Y56/2y7) Internal leaks at hydraulic cylinder, unlock/lock soft top compartment cover or at hydraulic cylinder, unlock/lock soft top bow		23⇒ 13 23⇒ 17 23⇒ 18 23⇒ 9 23⇒ 7 23⇒ 5 23⇒ 6 33⇒ 1

[1] Observe Preparation for Test, see 22.

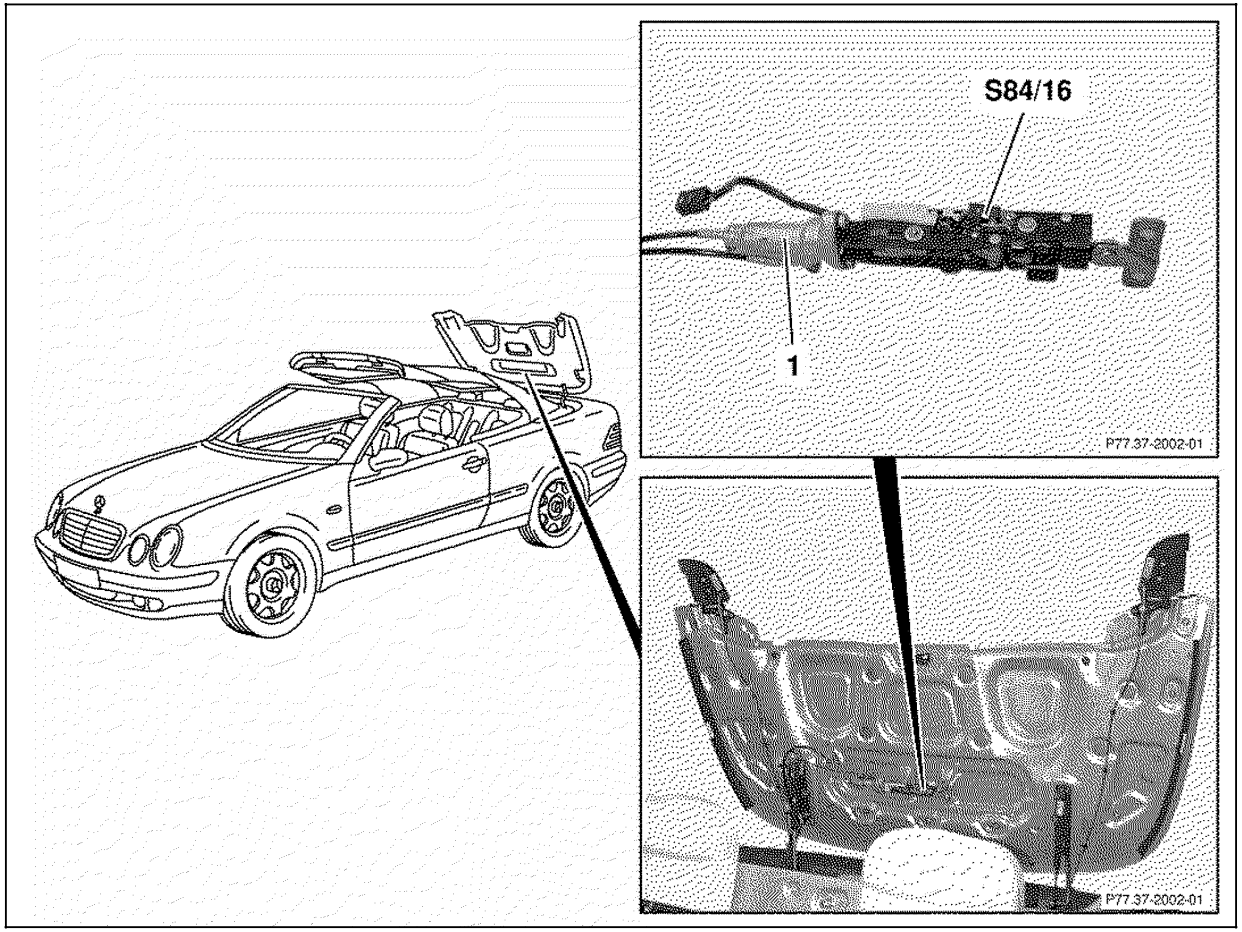
Electrical Test Program – Component Locations



P77.37-2007-11

A7/5	Rollbar hydraulic unit (power soft top)
A7/5k1	Hydraulic unit relay
A7/5m1	Motor
N52	Power soft top control module
Y56/2	Soft top control valve block (7 connections)
a	Manually switchable check valve for emergency operation of soft top

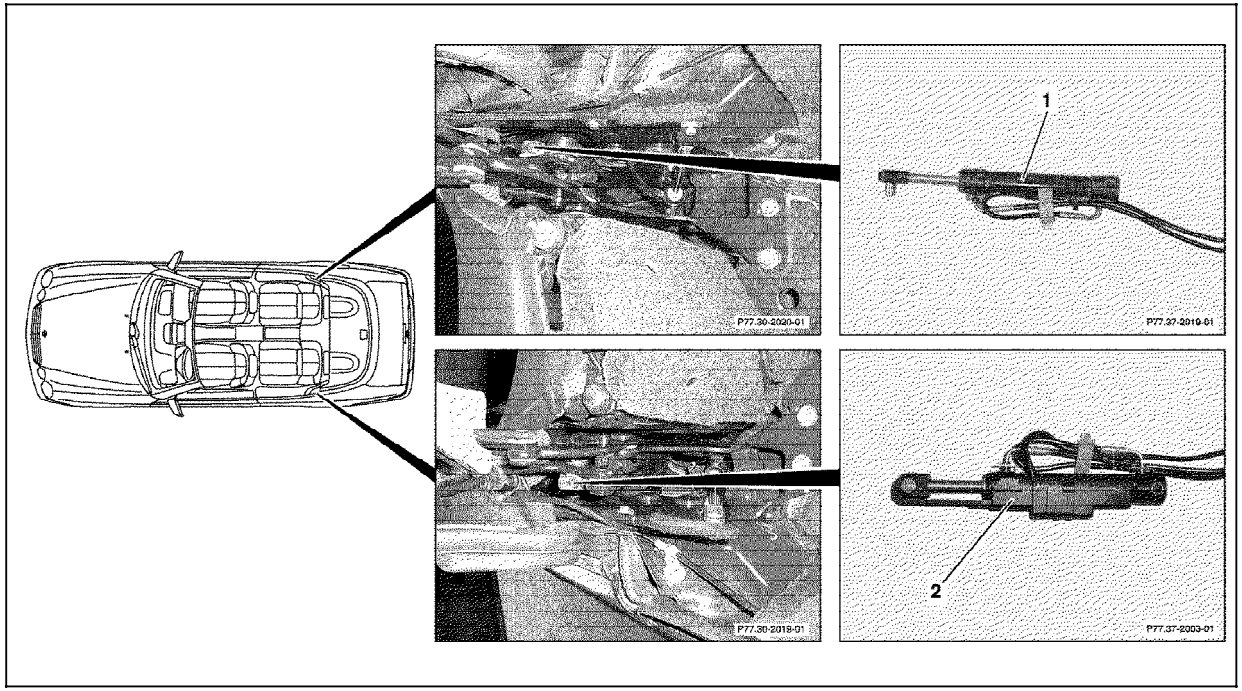
Electrical Test Program – Component Locations



P77.37-2018-06

1	Soft top bow hydraulic cylinder (locking/unlocking)
S84/16	Soft top bow locked limit switch

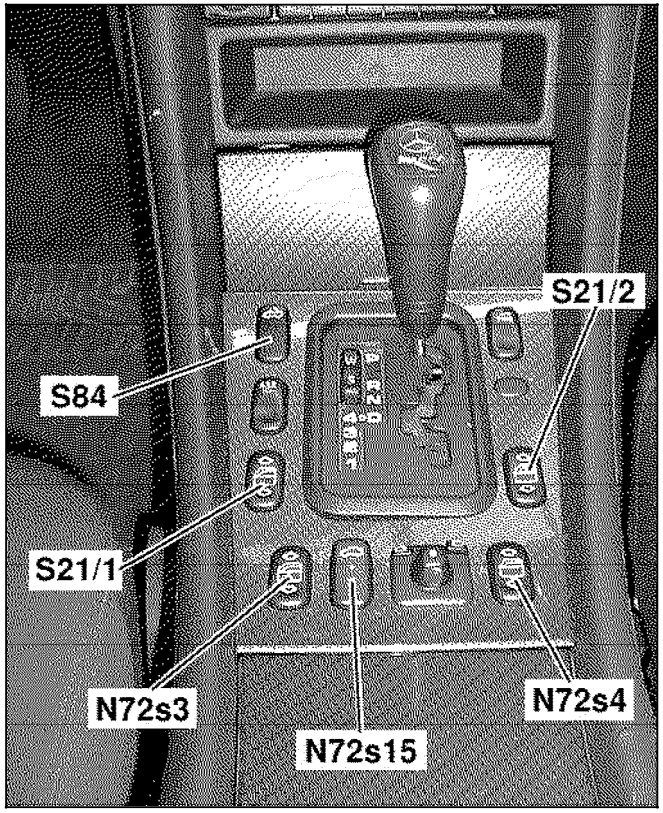
Electrical Test Program – Component Locations



P77.37-2020-09

1 Right soft top bow hydraulic cylinder (raising/lowering)
2 Left soft top bow hydraulic cylinder (setting up/lowering)

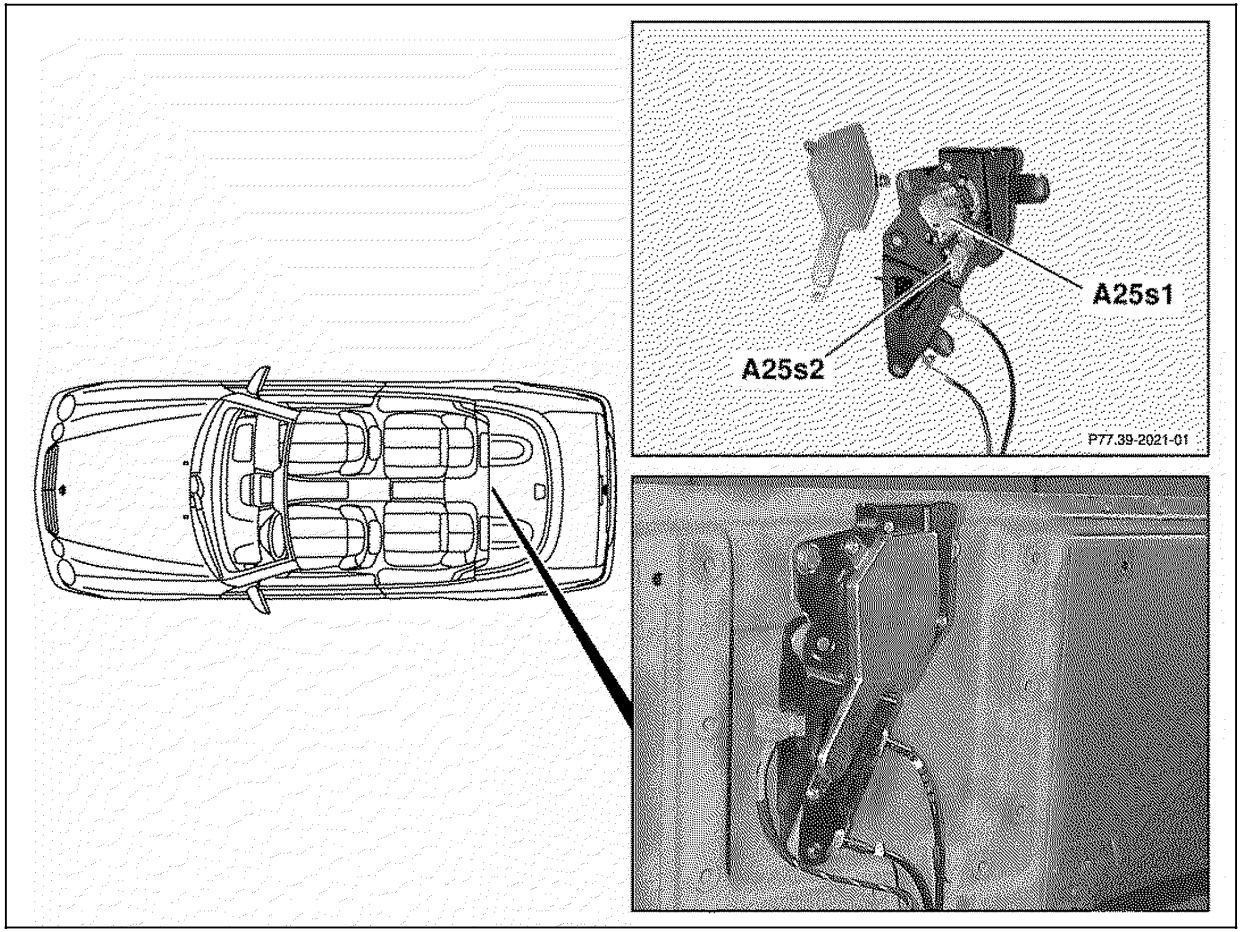
Electrical Test Program – Component Locations



P68.20-2006-02

N72s3	Left rear power window switch
N72s4	Right rear power window switch
N72s15	Remote trunk release (RTR) switch
S21/1	Left front power window switch (front center console)
S21/2	Right front power window switch (front center console)
S84	Power soft top switch

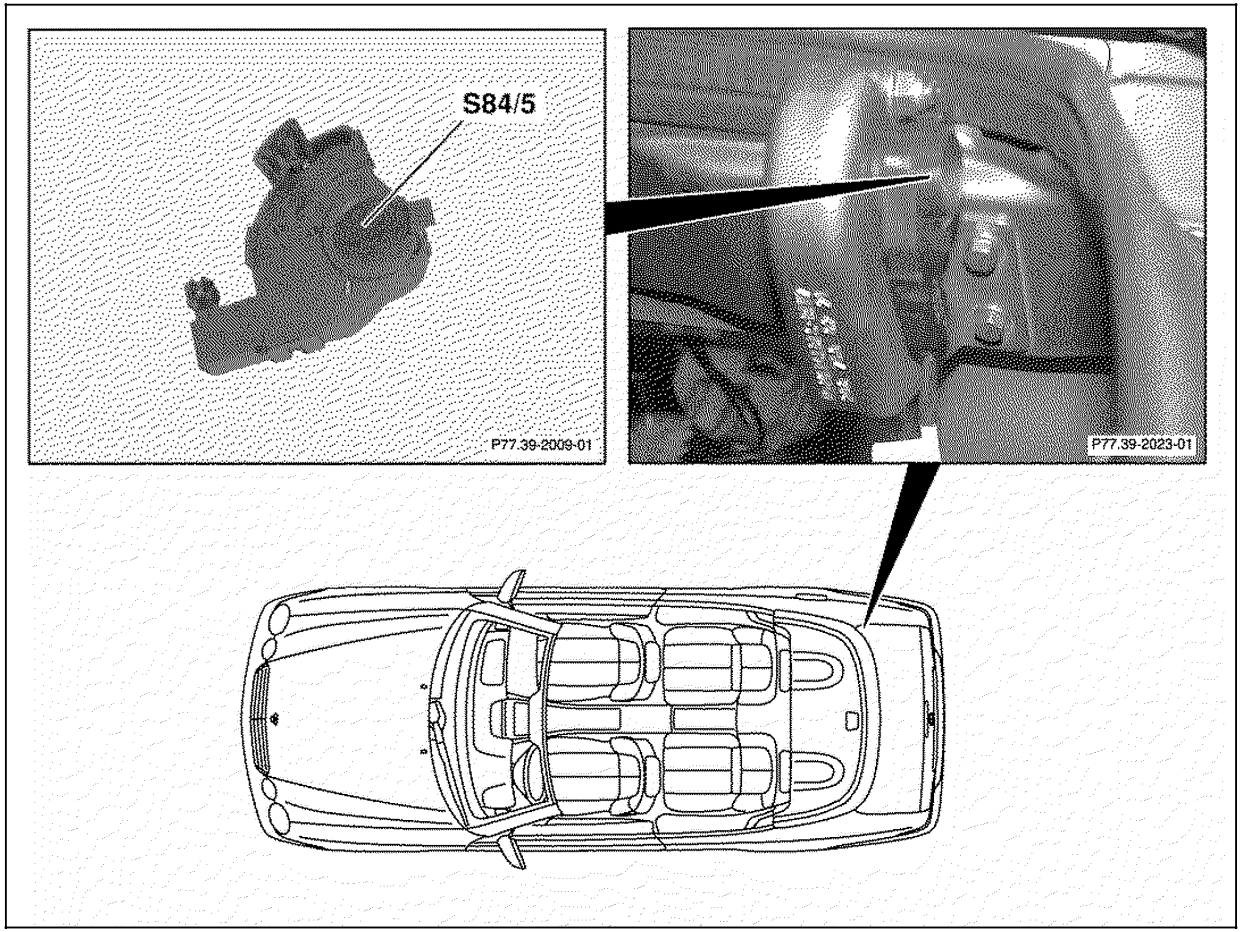
Electrical Test Program – Component Locations



P77.39-2022-06

A25s1 Cover "closed" switch
A25s2 Cover "locked" switch

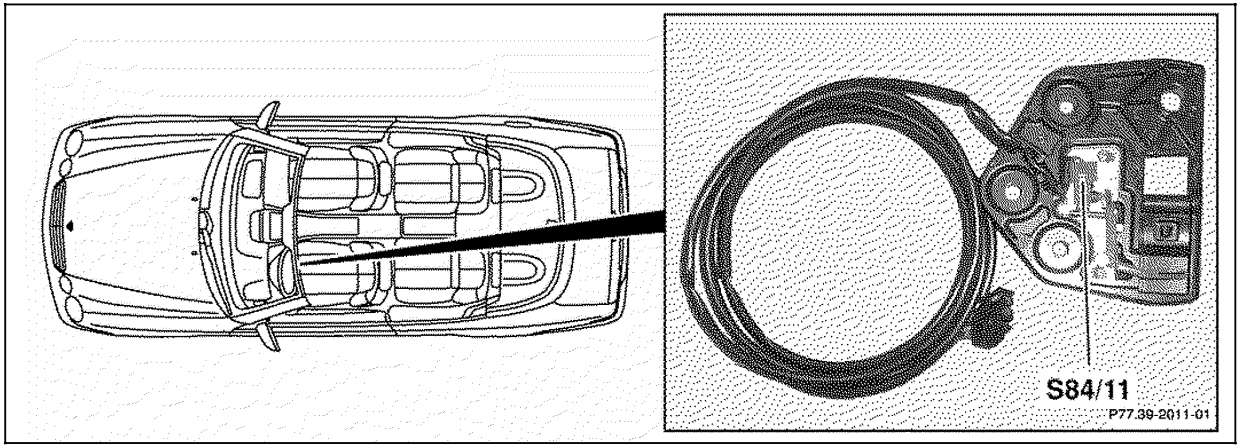
Electrical Test Program – Component Locations



P77.39-2010-06

S84/5 Soft compartment cover open switch

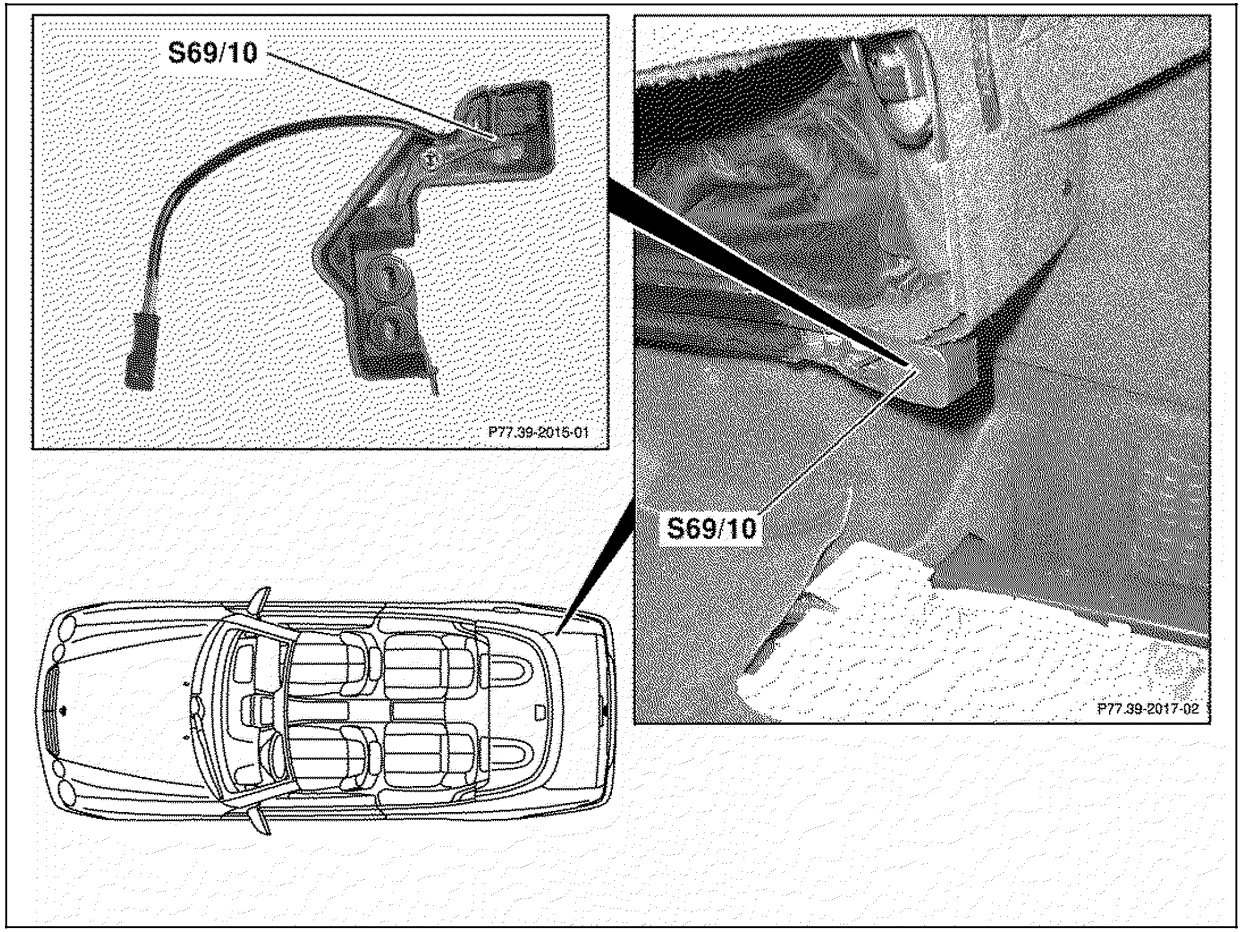
Electrical Test Program – Component Locations



P77.39-2012-04

S84/11 Soft top "locked" (left) limit switch

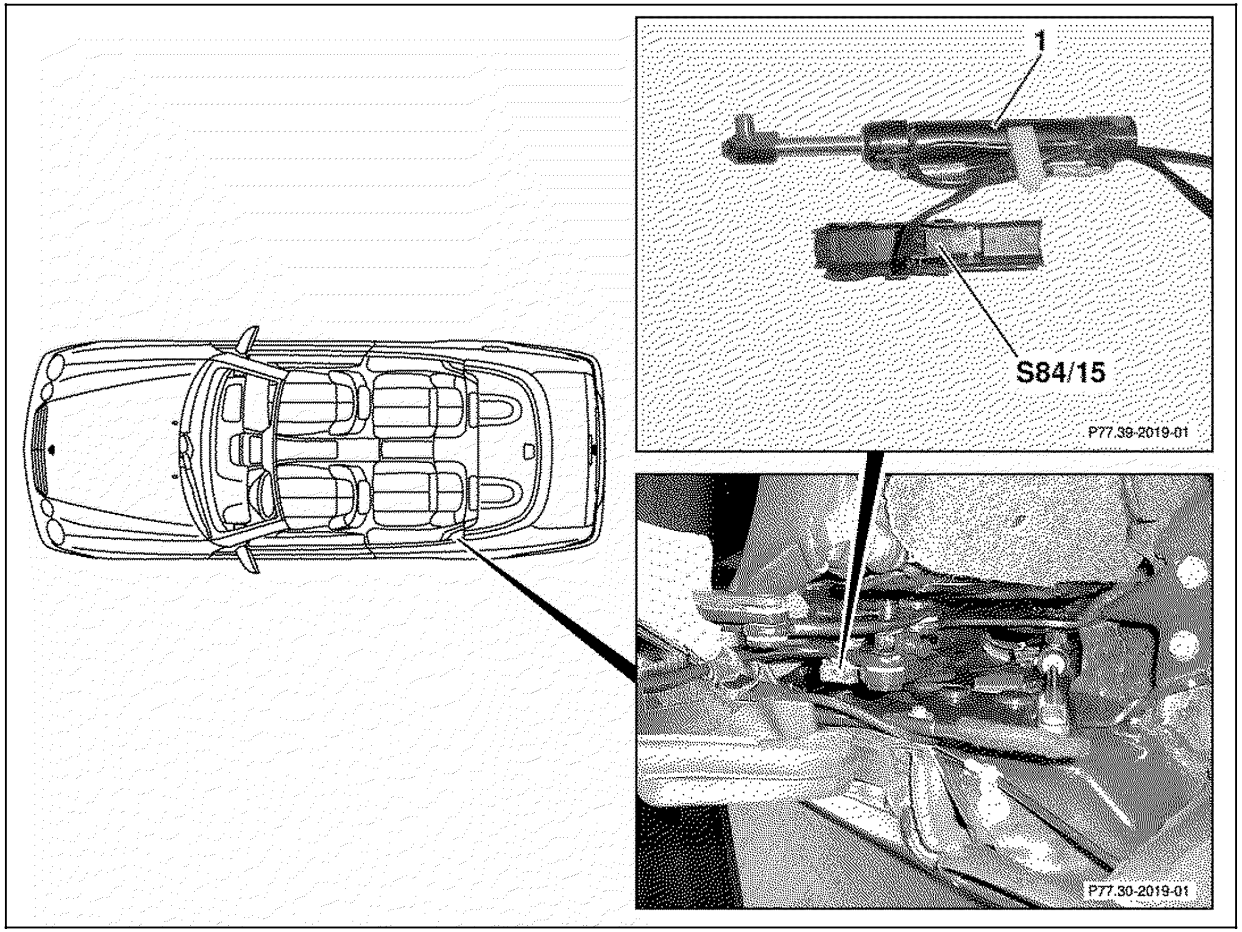
Electrical Test Program – Component Locations



S69/10 Retractable luggage cover engaged limit switch

P77.39-2016-06

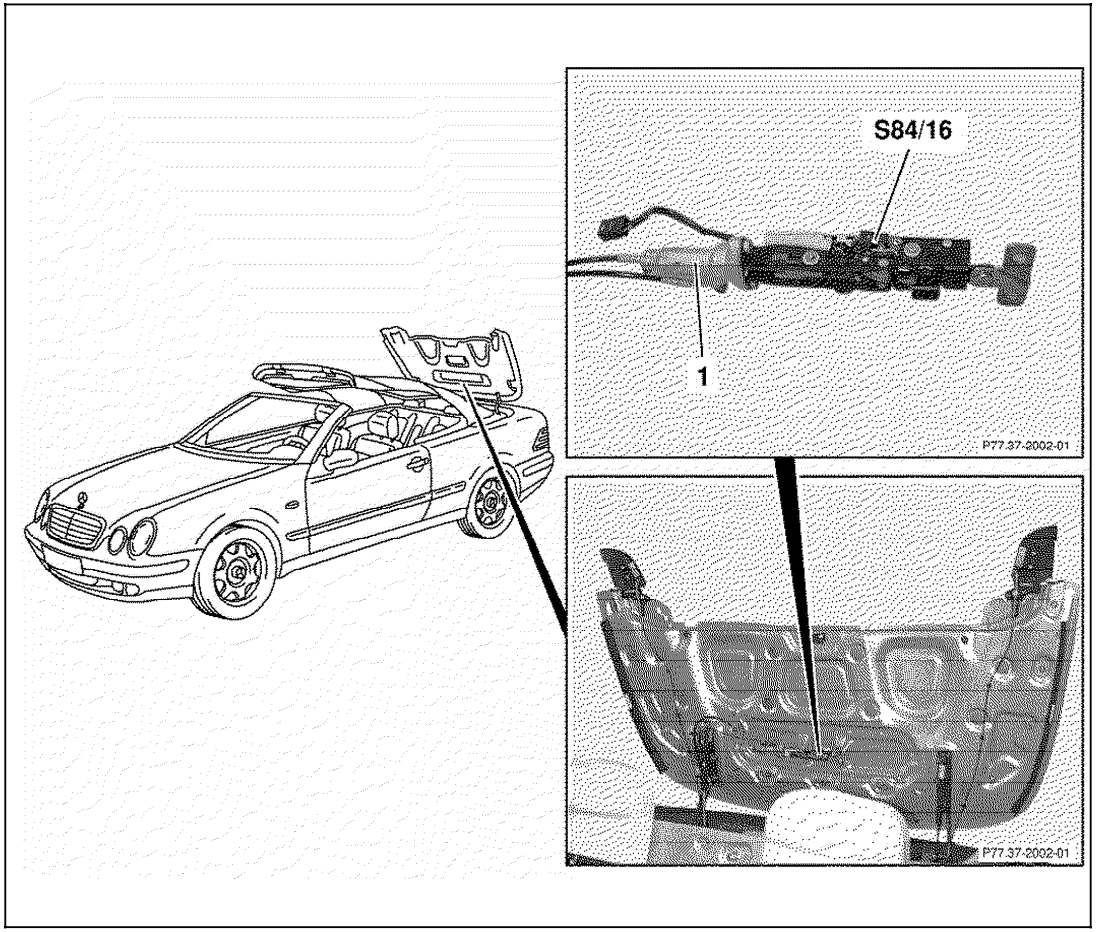
Electrical Test Program – Component Locations



P77.39-2020-06

S84/15 Soft top fabric bow up/down limit switch

Electrical Test Program – Component Locations



P77.37-2018-06

S84/16	Soft top fabric bow "locked" limit switch
1	Soft top bow hydraulic cylinder (locking/unlocking)

Electrical Test Program – Preparation for Test

Preliminary work:

- Battery voltage 11–14 V.
- Fuses OK.
- To avoid damage to the control modules, connectors should only be disconnected or connected with "Terminal 15R: **OFF**".
- Connect HHT as described in section 0 of the Diagnostic Manual.

The power window and roll bar systems are also activated when the soft top is operated. The complete diagnosis of these systems can be found in the following literature:
Power widows: DM, Body and Accessories, Volume 2; Section 5.4
Roll bar: DM, Body and Accessories, Volume 6; Section 19.5 (may not be released at time of print).

The soft top must never be unlocked or locked while driving and the soft top can only be operated when the vehicle is stationary.

To prevent a collision between the rear cover and the soft top compartment cover, the soft top can only be opened or closed automatically when the rear cover is closed.

To prevent damage to the soft top or items in the trunk:
- The soft top can only be opened or closed automatically when the trunk luggage cover is attached.
- Do not open or close the soft top when the soft top material is frozen or at temperatures below -15°C.
- Only open the soft top when it is clean.

Before opening the soft top with the power soft top switch (S84), the unlocking lever must be turned clockwise and the soft top raised slightly; then turn back and fold up the unlocking lever.
Once the soft top has closed automatically the unlocking lever must be turned clockwise and the soft top pulled onto the window frame; then turn the unlocking lever counterclockwise and fold up.

The following is to be observed after test and maintenance work:
If malfunctions occur when operating the soft top and the soft top remains in an intermediate position, the soft top is first to be moved manually to an end position (completely closed or completely opened). The roll bar (RB) control module (power soft top) (N52) then recognizes the exact position of the soft top. After this a function check is to be carried out.

Electrical wiring diagrams:
Electrical Troubleshooting Manual, Model 202/208.

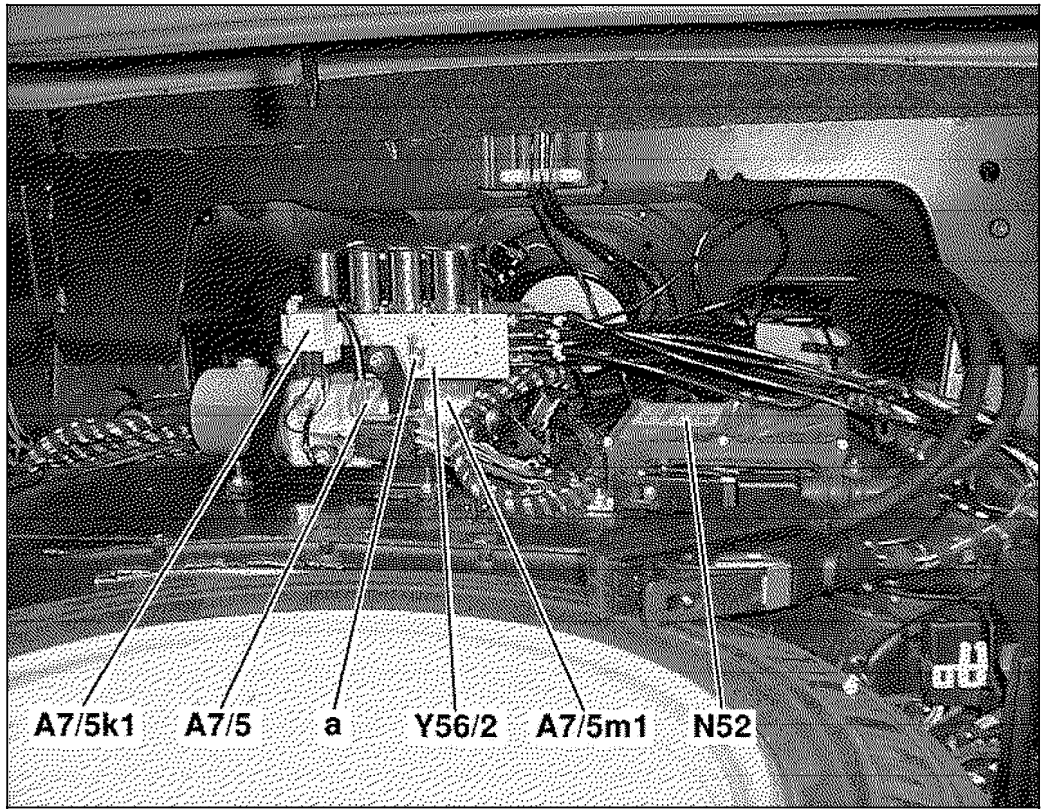
⚠ **WARNING!**
Danger of injury!
Prior to performing any testing, refer to 33/4 for important safety warnings and precautions.

Notes on emergency soft top operation
The soft top can be closed manually in the event of a defect in the soft top system or vehicle electrical system. If possible, this should be done carefully by two people.

Preparations:
The valve screw (a) on the hydraulic unit must first be opened before the emergency operation can be performed. As a result, the valve opens and the hydraulic cylinders (open/close soft top) are switched to return on the rod side. Only after this is it possible to move the soft top linkage manually.

The valve screw (a), is to be closed again after emergency operation. Otherwise, the soft top could be moved manually out of the soft top compartment by unauthorized persons. In addition, objects in the trunk would be fully accessible.

A7/5	Rollbar hydraulic unit (power soft top)
A7/5k1	Hydraulic unit relay
A7/5m1	Motor
N52	Power soft top control module
Y56/2	Soft top control valve block (7 connections)
a	Manually switchable check valve for emergency operation of soft top

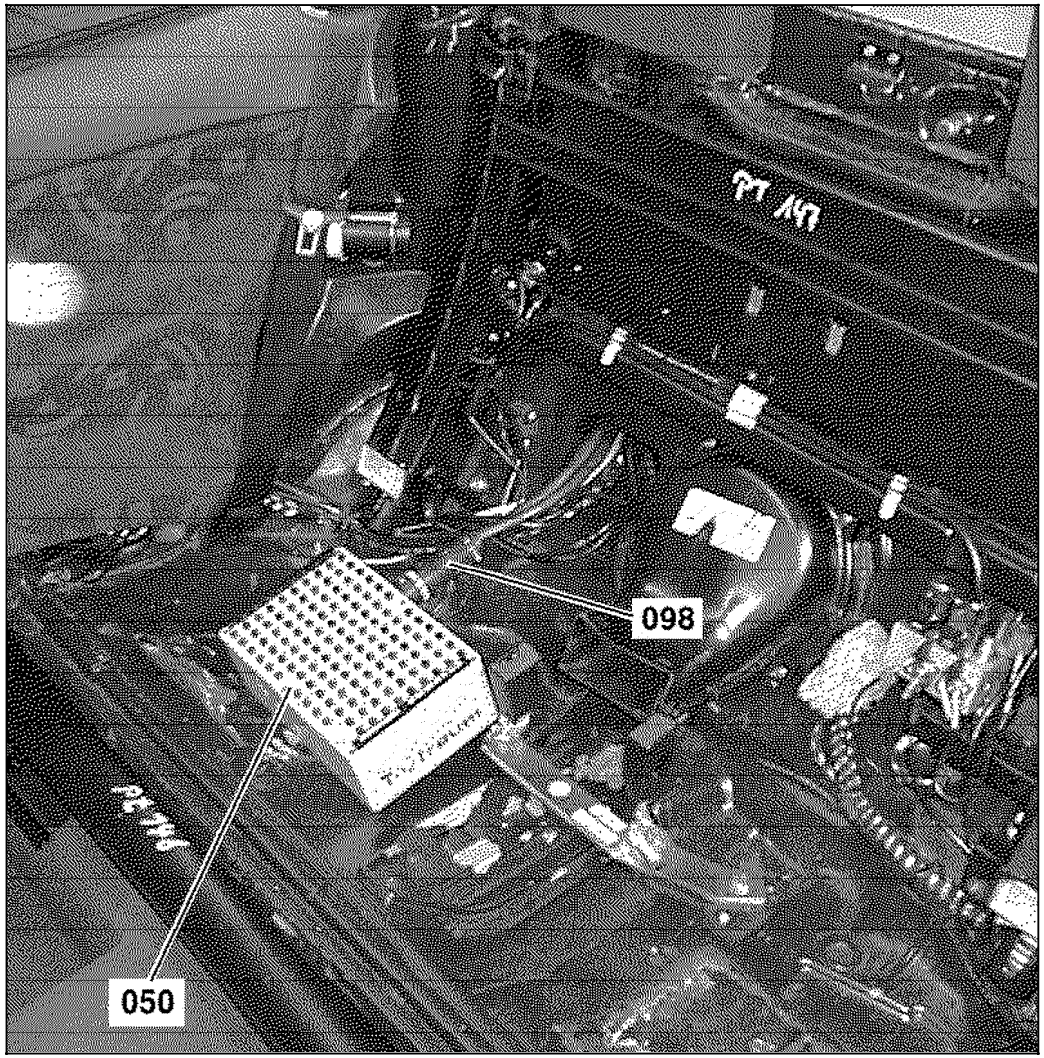


P77.37-2007-11

Note:
The exact procedure for emergency soft top operation can be found in the Owner's Manual.

Working with test cable and socket box

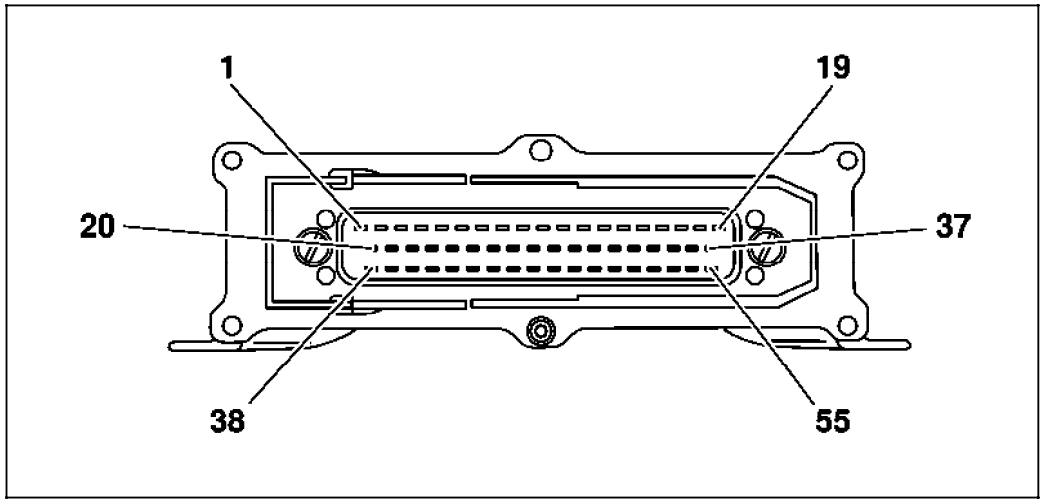
For test work on the soft top or rear side windows when using the 55-pin test cable, it is absolutely essential to observe the following:
Before connecting the test cable, if possible open the rear side windows with the power soft top switch (S84).
Only activate the rear power windows **briefly** when the test cable is connected so that the test cable is never overloaded due to the high current draw of the power window motors.



P77.39-2008-12

050 126-pin socket box
098 55-pin test cable

Connections on RB control module (power soft top) (N52)

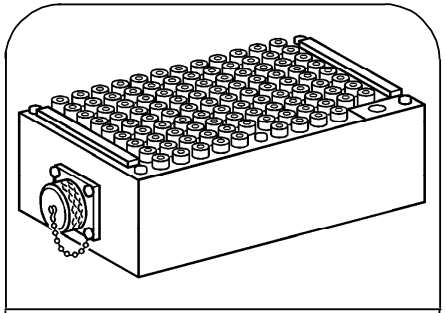


P77.39-2001-10

1	Connector, right rear power window motor (M10/6), +/-
2	Connector, left rear power window motor (M10/5), +/-
3	Terminal 31: Left rear power window motor (M10/5)
4	Terminal 30: Soft top, electronics
5	In-car temperature sensor (B10/4), switchover
6	Input, in-car temperature sensor (B10/4), switchover
7	Indicator lamp in roll bar switch (manual operation) (S83)
8	Actuation of soft top bow "closed" valve (Y56/2y4)
9	Actuation of power soft top compartment cover lock "open" valve (Y56/2y7)
10	Right soft top compartment cover locked switch (A25s2)
11	Soft top fabric bow up/down limit switch (S84/15), fabric tensioning bow in "down" position
2	–
13	Soft top fabric bow up/down limit switch (S84/15), fabric tensioning bow in "up" position
14	Terminal 15: Soft top, electronics
15	Soft top locked (left) limit switch (S84/11)
16	RB "retracted" switch (S83/5)
17	Right front power window switch (front center console) (S21/2)
18	Temperature signal of RB hydraulic unit (power soft top) (A7/5)
19	CAN data bus, low
20	Connector, right rear power window motor (M10/6), -/+
21	Terminal 31, right rear power window motor (M10/6)
22	Terminal 30, RB deployment solenoid (RB, Y57/1)
23	Actuation of piston side valve (Y57y11)
24	–
25	Malfunction indicator lamp in power soft top switch (S84)
26	Actuation of power soft top bow lock "open" valve (Y56/2y6)
27	Actuation of power soft top "closed" valve (Y56/2y2)
28	Retractable luggage cover engaged limit switch (S69/10)
29	Soft top fabric bow "locked" limit switch (S84/16)
30	Left front power window switch (front center console) (S21/1), ground
31	Soft top closed limit switch (S84/13s1)
32	Temperature signal of RB hydraulic unit (power soft top) (A7/5)
33	Soft top opened limit switch (S84/13s2)
34	RB "extended" limit switch (S83/6)
35	–
36	Left front power window switch (S21/1)
37	CAN data bus, high
38	Terminal 30: Right rear power window motor (M10/6)
39	Connection, left rear power window motor (M10/5), -/+
40	Terminal 30: Left rear power window motor (M10/5)
41	Terminal 30: Soft top, electronics
42	Actuation of hydraulic unit relay (A7/5k1) and RB rod side valve (Y57y10)
43	Actuation of power top fabric bow "open" (Y56/2y3)
44	Actuation of soft top "open" valve (Y56/2y1)
45	Actuation of power top compartment cover "open" (Y56/2y5)
46	Ground signal for actuations with the Hand-Held Tester (HHT)
47	Soft top compartment limit switch (closed) (A25s1)
48	–
49	Right front power window switch (front center console) (S21/2), ground
50	Soft top compartment "open" switch (S84/5)
51	Terminal 31: Soft top, electronics
52	Terminal 31: Soft top, electronics
53	Actuation of RB deployment solenoid (Y57/1)
54	RB switch (manual operation) (S83)
55	Power soft top switch (S84)

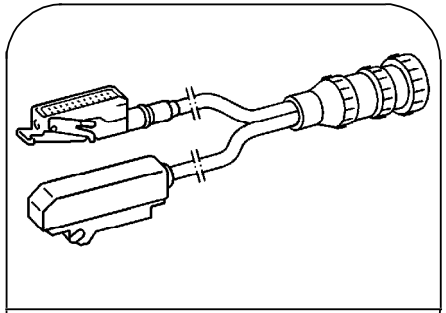
Electrical Test Program – Preparation for Test

Special Tools



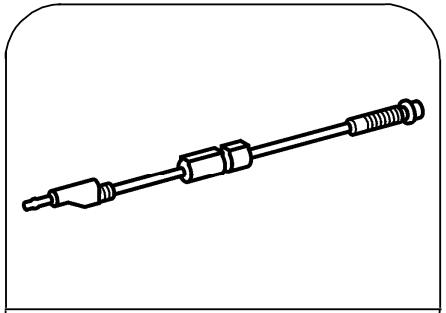
129 589 00 21 00

126-pin socket box



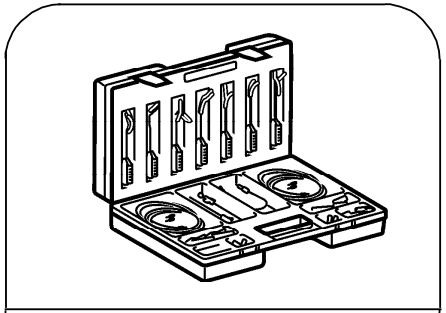
104 589 00 63 00

Test cable



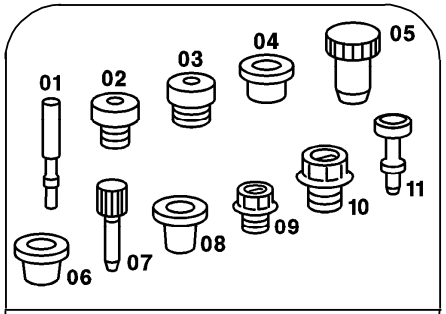
124 589 37 63 00

Fused cable



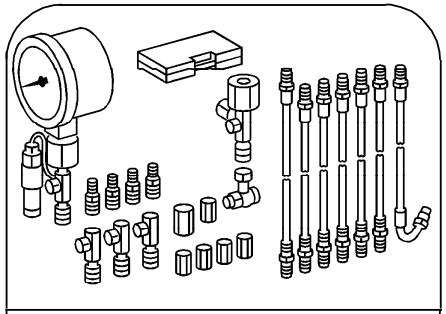
201 589 00 99 00

Electrical connecting set



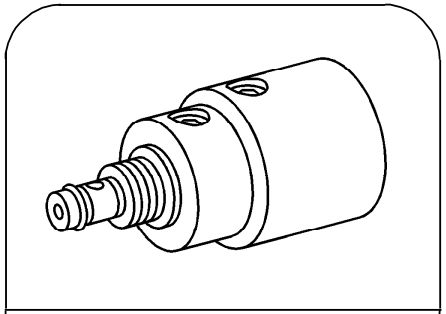
129 589 00 91 00

Set of plugs



126 589 14 21 00

Tester



129 589 08 63 00

Check valve

Conventional tools, test equipment

Description	Brand, model, etc.
Multimeter [1]	Fluke models 23, 83, 85, 87
Battery charger [1]	Local supply

[1] Available through the MBUSA Standard Equipment Program.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	B1000 B1010	**Roll bar control module power soft top (N52)** Voltage supply, terminal 30 for soft top electronics	N52 51 — (V) — 4 N52 52 — (V) — 41		11-14 V 11-14 V	Wiring.
1.1		Voltage supply, terminal 30 for left rear power window	N52 3 — (V) — 40	Left rear power window operated	11-14 V 11-14 V	Wiring.
1.2		Voltage supply, terminal 30 for right rear power window	N52 21 — (V) — 38	Right rear power window operated	11-14 V 11-14 V	Wiring.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.3		Voltage supply, terminal 15	N52 51 — ◄ V ► — 14	Ignition: **ON**	11-14 V	Wiring.
2.0		**Roll bar control module power soft top (N52)** Voltages on CAN data buses: Voltage on CAN LOW line Voltage on CAN HIGH line	N52 ⊥ ◄ V ► — 19 ⊥ ◄ V ► — 37	Ignition: **ON**	3.2 V (oscillating) 1.8 V (oscillating)	Wiring, Read out DTC's from control modules of CAN interior bus using HHT. Value OK: ⇒ 2.1
2.1		Voltage between CAN LOW and CAN high line	N52 37 — ◄ V ► — 19	Ignition: **OFF** Ignition: **ON** Ignition: **OFF** after approx. 30 seconds ("Sleep mode")	- 1.4 V 1.4 V 4.8 V	Wiring, Read out DTC's from control modules of CAN interior bus using HHT.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.0	B1645	**Power soft top switch (S84)** Voltage supply and signal voltages.	N52 52 — V — 55	Ignition: **ON** S84 in rest position. S84 operated towards **"close soft top".** S84 operated towards **"open soft top".**	- 11 – 14 V 0 – 1 V Approx. 3V	Roll bar control module power soft top (N52). ⇒ 3.1
3.1		Resistance	N52 52 — Ω — 55	Ignition: **OFF** Test cable disconnected from control module. S84 in rest position. S84 operated towards **"open soft top".** S84 operated towards **"close soft top".**	 > 20 kΩ Approx. 200 Ω approx. 1 Ω	Only one value not OK: S84. Several values not OK: wiring, or S84.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
4.0		**Indicator lamp in power soft top switch (S84)** Voltage supply from roll bar control module (power soft top) (N52)	S84 1 — (–V+) — 2	Connector on S84 disconnected. Soft top unlocked manually. Ignition: **ON**	approx. 11 V	N52, Nominal value OK, but still inoperative when connector is plugged in: Wiring, S84. Value OK: ⇒ 4.1
4.1		Illumination	S84 1 — (–V+) — 5	Connector on S84 disconnected Exterior lamp switch S1 (terminal 58d): **ON** Adjust maximum brightness at instrument cluster (A1)	approx. 11 V	Wiring, Value OK but still no illumination when connector is plugged in: S84.
5.0	81647 10	**RB hydraulic unit (power soft top); hydraulic unit relay (A7/5k1)**, voltage supply, terminal 30 measured at relay base.	A7/5k1 4 — (–V+) — 2	A7/5k1 disconnected	11–14 V	Wiring, Value OK ⇒ 5.1

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.1		Actuation of RB hydraulic unit (power soft top); hydraulic unit relay (A7/5k1) by roll bar control module (power soft top) (N52) measured at relay base.	A7/5k1 4 — (V) — 6	Roll bar: Retracted. A7/5k1 disconnected. Ignition: **OFF** and **ON** again. RB switch (manual operation) (S83) operated towards "extend roll bar"	11–14 V	Wiring, Value OK ⇒ 5.2 Value OK ⇒ 5.3
5.2		Actuation of A7/5k1 by N52, measured at N52	N52 52 — (V) — 42	Roll bar: Retracted. A7/5k1 plugged in. Socket box connected. Ignition: **OFF** and **ON** again S83 operated towards "extend roll bar"	11–14 V	S83, Voltage supply from N52 Value OK: Wiring.
5.3		Voltage supply, terminal 30 under load, measured at relay base	A7/5k1 4 — (V) — 2	Roll bar: Retracted. A7/5k1 plugged in. S83 operated towards "extend roll bar"	11–14 V	Wiring, Value OK ⇒ 5.4

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.4		Output voltage of RB hydraulic unit (power soft top) relay (A7/5k1), measured at relay base	A7/5k1 4 — (−) V (+) — 8	Roll bar: Retracted. A7/5k1 plugged in. Ignition: **ON** S83 operated towards "extend roll bar"	 11–14 V	A7/5k1.
6.0		**Resistance of RB hydraulic unit (power soft top) motor (A7/5m1)**, measured at relay base	A7/5m1 A7/5k1 ⊥ (−) Ω (+) — 8	A7/5k1 at RB hydraulic unit (power soft top) (A7/5). Ignition: **OFF**	 approx. 1 Ω	Wiring, A7/5m1.
7.0	B1644	**Resistance of RB hydraulic unit (power soft top) overload protection thermocouple (A7/5b1)** measured at roll bar control module (power soft top) (N52)	N52 32 — (−) Ω (+) — 18	Test cable at N52 disconnected. Ignition: **OFF** Pump temperature: 25 °C 30 °C 40 °C 120 °C	 220±22 kΩ 178±18 kΩ 121±12.5 kΩ 10± 2 kΩ	Wiring ⇒ 7.1

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
7.1		Resistance of RB hydraulic unit (power soft top) connector (A7/5x1)	A7/5x1 2 — Ω — 1	Test cable at N52 disconnected. Ignition: OFF Pump temperature: 25 °C 30 °C 40 °C 120 °C	 220±22 kΩ 178±18 kΩ 121±12.5 kΩ 10± 2 kΩ	A7/5b1.
8.0	B1650 B1650 12	**Retractable luggage cover engaged limit switch (S69/10)** Voltage supply and signal voltage	N52 ⊥ — V — 28	Ignition: **ON** Trunk luggage cover: **Pulled out** **Rolled in**	 0-1 V 11-14 V	**Both** values not OK: roll bar control module (power soft top) (N52), **One** value not OK: ⇒ 8.1
8.1		Resistance	N52 ⊥ — Ω — 28	Ignition: **OFF** Disconnect test cable from control module. Trunk luggage cover: **Pulled out** **Rolled in**	 0-5 Ω > 20 kΩ	Wiring. S69/10, Value OK: N52

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
9.0	81650 81650 02	**Soft top locked (left) limit switch (S84/11)** Voltage supply and signal voltage	N52 ⊥ –(V)+ ❯— 15	Ignition: **ON** Soft top: **Locked** **Unlocked**	 0-1 V 11-14 V	Both values not OK: Roll bar control module (power soft top) (N52), One value not OK: ⇒ 9.1
9.1		Resistance	N52 ⊥ –(Ω)+ ❯— 15	Ignition: **OFF** Disconnect test cable from control module. Soft top: **Locked** **Unlocked**	 0-5 Ω > 20 kΩ	Wiring. S84/11. Value OK: N52.
10.0	81650 81650 04	**Soft top opened limit switch (S84/13s2)** Voltage supply and signal voltage	N52 ⊥ –(V)+ ❯— 33	Ignition: **ON** Soft top: **Completely open** **Closed**	 0-1 V 11-14 V	**Both** values not OK: N52. **One** value not OK: ⇒ 10.1

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
10.1		Resistance	N52 ⊥ Ω 33	Ignition: **OFF** Test cable disconnected from control module. Soft top: **Open** **Completely open**	 > 20 kΩ 0-5 Ω	Wiring. Soft top opened limit switch (S84/13s2). Value OK: Roll bar control module (power soft top) (N52).
11.0	B1650 B1650 05	**Soft top closed limit switch (S84/13s1)** Voltage supply and signal voltage	N52 ⊥ V 31	Ignition: **ON** Soft top: **Completely closed** **Open**	 0-1 V 11-14 V	**Both** values not OK: N52. **One** value not OK: ⇒ 11.1
11.1		Resistance	N52 ⊥ Ω 31	Ignition: **OFF** Test cable disconnected from control module. Soft top: **Open** **Completely closed**	 > 20 kΩ 0-5 Ω	Wiring. S84/13s1. Value OK: N52.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
12.0	81650 81650 06	**Soft top compartment "open" switch (S84/5)** Voltage supply and signal voltage	N52 ⊥ ◄-Ⓥ+► ❩— 50	Ignition: **ON** Soft top compartment cover: **Completely open** **Closed**	 0-1 V 11-14 V	Both values not OK: Roll bar control module (power soft top) (N52). Only one value not OK: ⇒ 12.1
12.1		Resistance	N52 ⊥ ◄-Ω+► ❩— 50	Ignition: **OFF** Test cable disconnected from control module: Soft top compartment cover: **Completely open** **Closed**	 0-5 Ω > 20 kΩ	Wiring. S84/5. Value OK: N52.
13.0	81650 81650 07	**Soft top compartment closed limit switch (A25s1)** Voltage supply and signal voltage	N52 ⊥ ◄-Ⓥ+► ❩— 47	Ignition: **ON** Soft top compartment cover: **Closed** **Open**	 0-1 V 11-14 V	**Both** values not OK N52. **One** value not OK: ⇒ 13.1

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
13.1		Resistance	N52 ⊥ Ω — 47	Ignition: **OFF** Test cable disconnected from control module Soft top compartment cover: **Open** **Closed**	 > 20 kΩ 0-5	Wiring Soft top compartment closed limit switch (A25s1). Value OK: Roll bar control module (power soft top) (N52).
14.0	81650 81650 08	**Soft top compartment locked limit switch (A25s2)** Voltage supply and signal voltage	N52 ⊥ V — 10	Soft top compartment cover: **Locked** **Unlocked**	 0-1 V 11-14 V	**Both** values not OK: N52. One value not OK: ⇒ 14.1
14.1		Resistance	N52 ⊥ Ω — 10	Ignition: **OFF** Disconnect test cable from control module Soft top compartment cover: **Locked** **Unlocked**	 0-5 Ω > 20 kΩ	Wiring. A25s2. Value OK: N52.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
15.0	81650 81650 09 81650 10	**Soft top fabric bow up/down limit switch (S84/15)** Voltage supply and signal voltage of "soft top bow down"switch contact	N52 ⊥ ◄-Ⓥ+► 11	Ignition: **ON** Soft top bow: **Completely down** **Up**	 0-1 V 11-14 V	**Both** values not OK: Roll bar control module (power soft top) (N52). **One** value not OK: ⇒ 15.2 Value OK: ⇒ 15.1
15.1		Voltage supply and signal voltage of "soft top bow up" switch contact	N52 ⊥ ◄-Ⓥ+► 13	Ignition: **ON** Soft top bow: **Completely up** **Down**	 0-1 V 11-14 V	**Both** values not OK: N52. **One** value not OK: ⇒ 15.3
15.2		Resistance of "soft top bow down" switch contact	N52 ⊥ ◄-Ω+► 11	Ignition: **OFF** Disconnect test cable from control module Soft top bow: **Up** **Completely down**	 > 20 kΩ 0-5 Ω	Wiring. S84/15. Value OK: N52.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
15.3		Resistance of "soft top bow up" switch contact	N52 ⊥ Ω — 13	Ignition: **OFF** Disconnect test cable from control module. Soft top bow: **Down** **Completely up**	 > 20 kΩ 0-5 Ω	Wiring. Soft top fabric bow up/down limit switch (S84/15). Value OK: Roll bar control module (power soft top) (N52).
16.0	B1650 B1650 II	**Soft top bow locked limit switch (S84/16)** Voltage supply and signal voltage	N52 ⊥ V — 29	Ignition: **ON** Soft top bow: **Locked** **Unlocked**	 0-1 V 11-14 V	**Both** values not OK: N52. **One** value not OK: ⇒ 16.1
16.1		Resistance	N52 ⊥ Ω — 29	Ignition: **OFF** Test cable disconnected from control module Soft top bow: **Unlocked** **Locked**	 > 20 kΩ 0-5 Ω	Wiring. S84/16. Value OK: N52.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
17.0	B1650 B1650 00	**RB "retracted" switch (S83/5)** Voltage supply and signal voltage	N52 ⊥ –(V)+ ❩— 16	Ignition: **ON** Roll bar: **Completely retracted** **Extended**	 0-1 V 11-14 V	**Both** values not OK: Roll bar control module (power soft top) (N52). **One** value not OK: ⇒ 17.1.
17.1		Resistance	N52 ⊥ –(Ω)+ ❩— 16	Ignition: **OFF** Test cable on N52 disconnected Roll bar: **Completely retracted** **Extended**	 0-5 Ω > 20 kΩ	Wires. S83/5. Values OK: N52.
18.0	B1650 B1650 01	**RB "extended" limit switch (S83/6)** Voltage supply and signal voltage	N52 ⊥ –(V)+ ❩— 34	Ignition: **ON** Rollover bar: **Extended** **Completely retracted**	 0-1 V 11-14 V	Both values not OK: N52. Only one value not OK: ⇒ 18.1

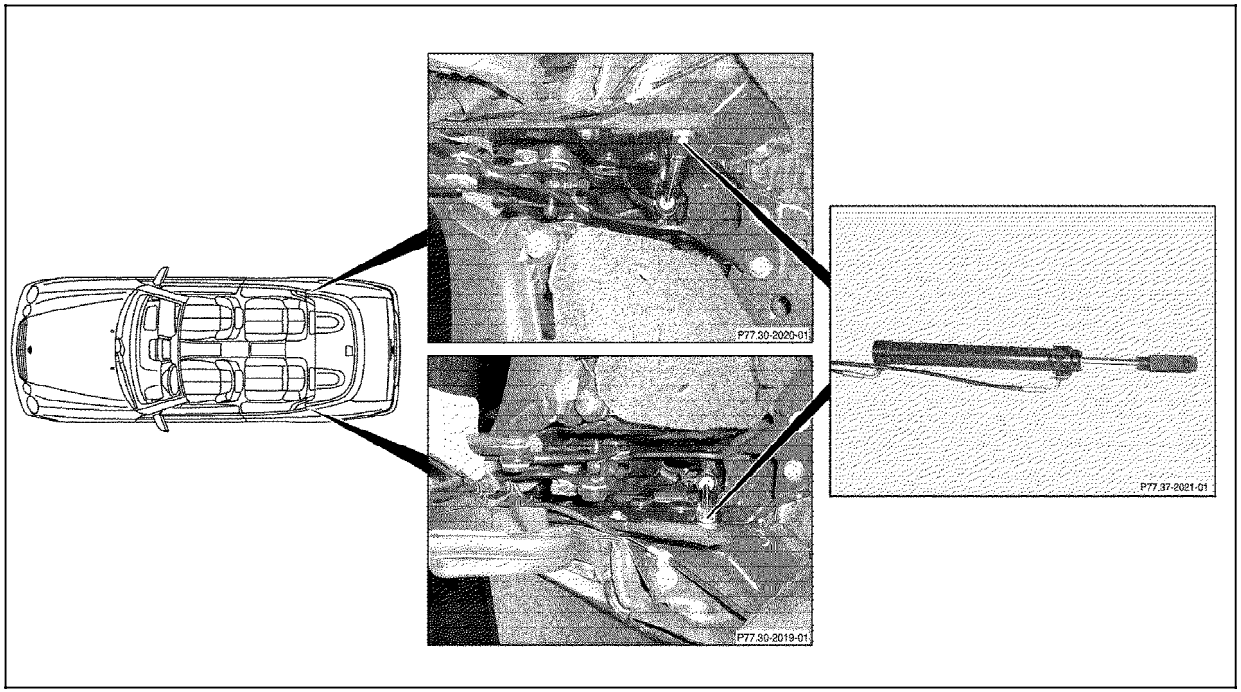
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
18.1		Resistance	N52 ⊥ Ω 34	Ignition: **OFF** Test cable on Roll bar control module (power soft top) (N52) disconnected. Roll bar: **Extended** **Completely retracted**	 0-5 Ω > 20 kΩ	Wiring. RB “extended” limit switch (S83/6). Values OK: N52.
19.0	81648	**RB deployment solenoid (Y57/1)** Resistance	N52 53 Ω 22	Ignition: **OFF** Test cable on N52 disconnected.	approx. 1 Ω	Wiring Y57/1. Value OK ↓ ⇒ 19.1
19.1		Voltage supply from N52	N52 52 V 22	Test cable plugged in to N52. Ignition: **ON**	11–14 V	N52.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
20.0	B1646	**RB switch (manual operation) (S83)** Voltage supply and signal voltages	N52 ⊥ –V+ 54	Ignition: **ON** S83 in rest position. Operate S83 towards "extend roll bar". Operate S83 towards "retract roll bar".	 11-14 V approx. 3 V 0-1 V	**One** value not OK: S83. All three values 11-14 V: Wiring. S83. ⇒ 20.1
20.1		Resistances	N52 ⊥ –Ω+ 54	Ignition: **OFF** Test cable on roll bar control module (power soft top) (N52) disconnected. S83 in rest position. S83 operated towards "extend rollover bar". Power soft switch (S84) operated towards "retract rollover bar".	 > 20 kΩ approx. 250 Ω approx. 1 Ω	**One** value not OK: S83. **Two** or **three** values not OK: Wiring, or S83. Values OK: N52.

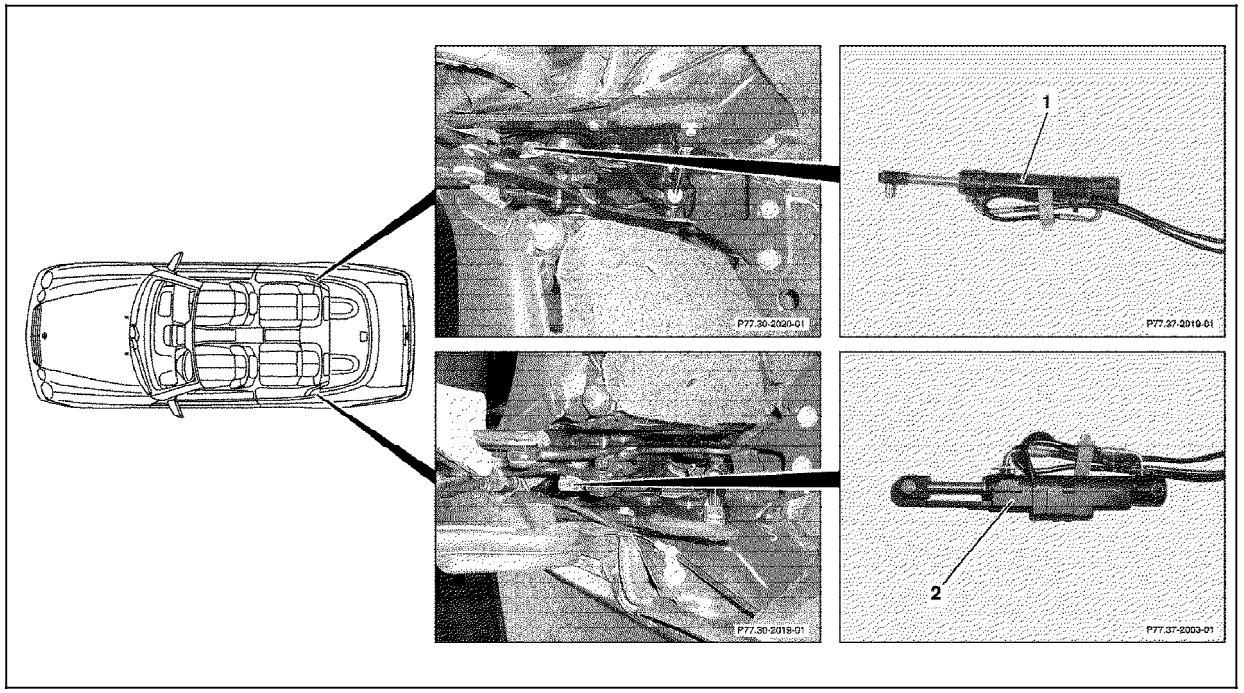
Hydraulic Test Program – Component Locations



Soft top hydraulic cylinders (opening/closing)

P77.37-2022-09

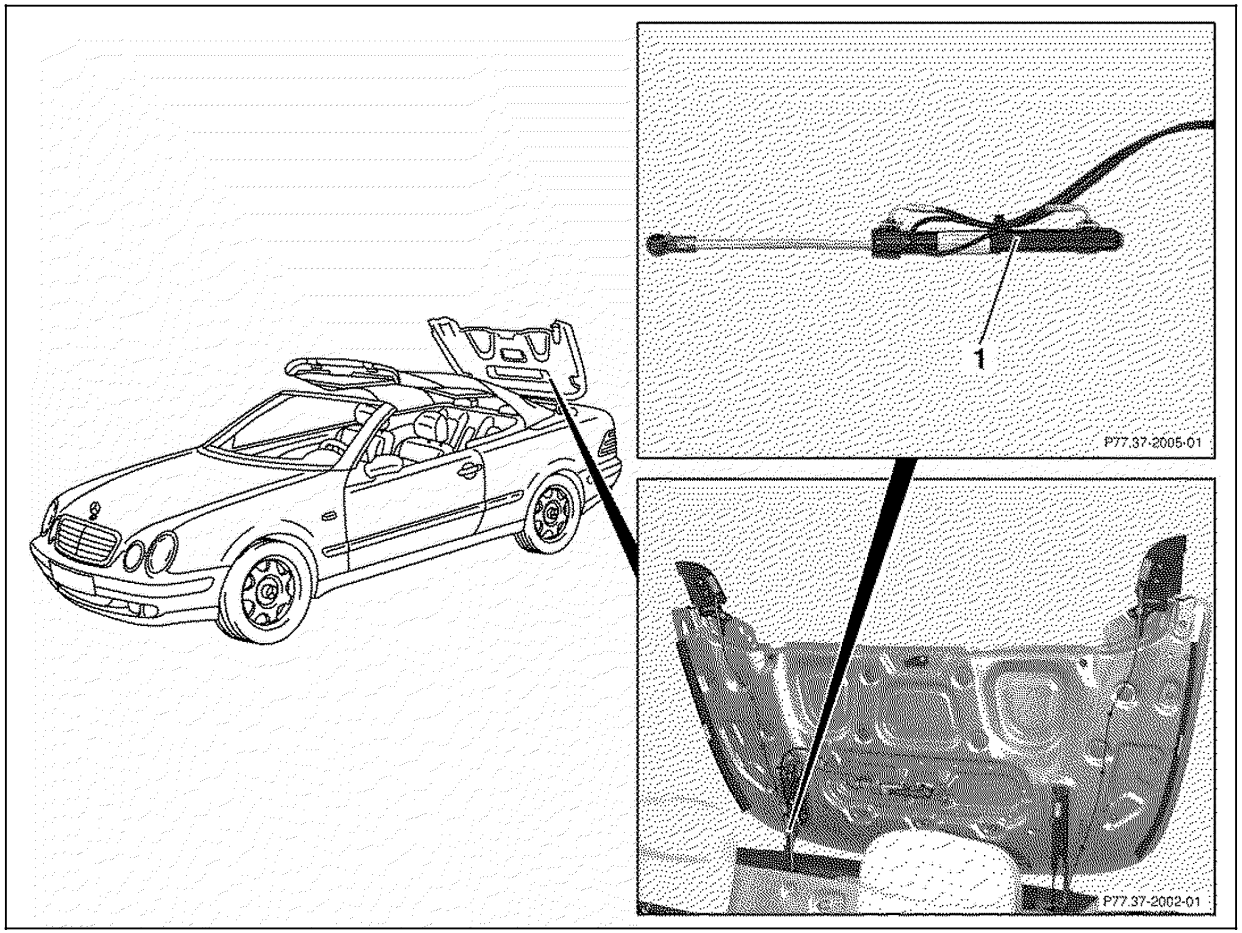
Hydraulic Test Program – Component Locations



P77.37-2020-09

1 Right soft top bow hydraulic cylinder (raising/lowering)
2 Left soft top bow hydraulic cylinder (setting up/lowering)

Hydraulic Test Program – Component Locations



P77.37-2016-06

1 Soft top compartment cover hydraulic cylinder (opening/closing)

Hydraulic Test Program –Test

⚠ **WARNING: Risk of Personal Injury!**

MOVING COMPONENTS

When working on components which are moved by hand, by electric motor, by hydraulic or pneumatic means via a connecting mechanism, severe injury may be sustained as a result of severing, trapping or crushing of limbs.

Safety precautions for working with moving components:
- Keep the danger zone under surveillance.
- When moving components, protect the range of mechanical movement against interference.
- Do not reach into the mechanism of a component while energizing electric motors via testers (HHT) or directly via terminal 30.
  Make sure that test cables are of sufficient length.

During work in the area of the roll bar, there is a risk of serious injury should the roll bar suddenly deploy.
The roll-over sensors are integrated into the roll bar control module (power soft top) (N52), the roll bar may be activated inadvertently during diagnosis or maintenance work on N52.
Moreover, the roll bar may still be triggered up to 1 hour after the ignition has been switched off. It is therefore not sufficient just to switch off the ignition.

Precautions/rules for handling roll bars:
- Always monitor the danger area.
- Always raise the roll bar before carrying out any work in its vicinity.
- Should it not be possible to raise the roll bar due to a malfunction, the vehicle's battery (G1) must be disconnected.
- Ensure that parts of the body are kept a safe distance from the area in which the roll bar's mechanism moves.

HYDRAULIC SYSTEMS

Serious injuries can be caused to the skin or eyes when loosening hydraulic lines if the system is not previously depressurized due to the very high pressures (above 200 bar). Damage to the skin may be caused if unprotected skin comes into contact with hydraulic fluid, particularly central hydraulic fluid (this is especially harmful to health).

Anyone who swallows hydraulic fluid can expect to suffer symptoms of poisoning including headaches, dizziness, stomach ache, vomiting, diarrhea, cramps and unconsciousness

Safety measures/operating instructions for working with hydraulic systems:
- Before starting work on hydraulic systems they should be depressurized and the system must be emptied if necessary.
- Do not pour hydraulic fluid into drinking containers.
- Ensure adequate ventilation, particularly in the case of central hydraulic fluid.
- Ensure only authorized persons have access to hydraulic fluid.
- Seal disconnected lines and hoses and connections on the subassemblies immediately with blind plugs.
- Wear **safety gloves**, **protective clothing** and **safety glasses**.
  If it is not possible to wear safety gloves, the following points are to be observed:
  Only allow hydraulic fluid to come into contact with the skin for as short a time as possible, wash fluid off skin with soap and water.
  Change wet clothing as quickly as possible.

Hydraulic Test Program –Test

Notes for Hydraulic Tests:

Actuation using Hand Held Tester (HHT)
For actuation using the HHT, the contact of the power soft top test connector (X11/12) must be routed to ground.
It is absolutely essential to remove the connection when the actuations are completed.
Note:
X11/12 is located in the area of the data link connector (DTC readout) (X11/4).

Visual inspection
To ensure that satisfactory visual inspection can be carried out in the event of oil loss in the hydraulic system, the appropriate trim parts and rear seat system are to be removed**.**

Bleeding soft top/roll bar hydraulic system
The hydraulic system bleeds itself automatically after the soft top is operated 2-3 times.

Reducing pressure in the soft top/roll bar hydraulic system
The pressure in the soft top/roll bar hydraulic system may still be present after taking a pressure measurement. There are 3 alternatives for reducing pressure before unscrewing the test line:

- Close the soft top (manually if necessary) but do not lock.
  Switch the ignition on and off again twice in quick succession.

- Connect HHT then connect contact of power soft top test connector (X11/12) to vehicle ground.
  Ignition: **ON**
  Perform actuation, "pressure reducing".
  Disconnect contact at power soft top test connector (X11/12) again.

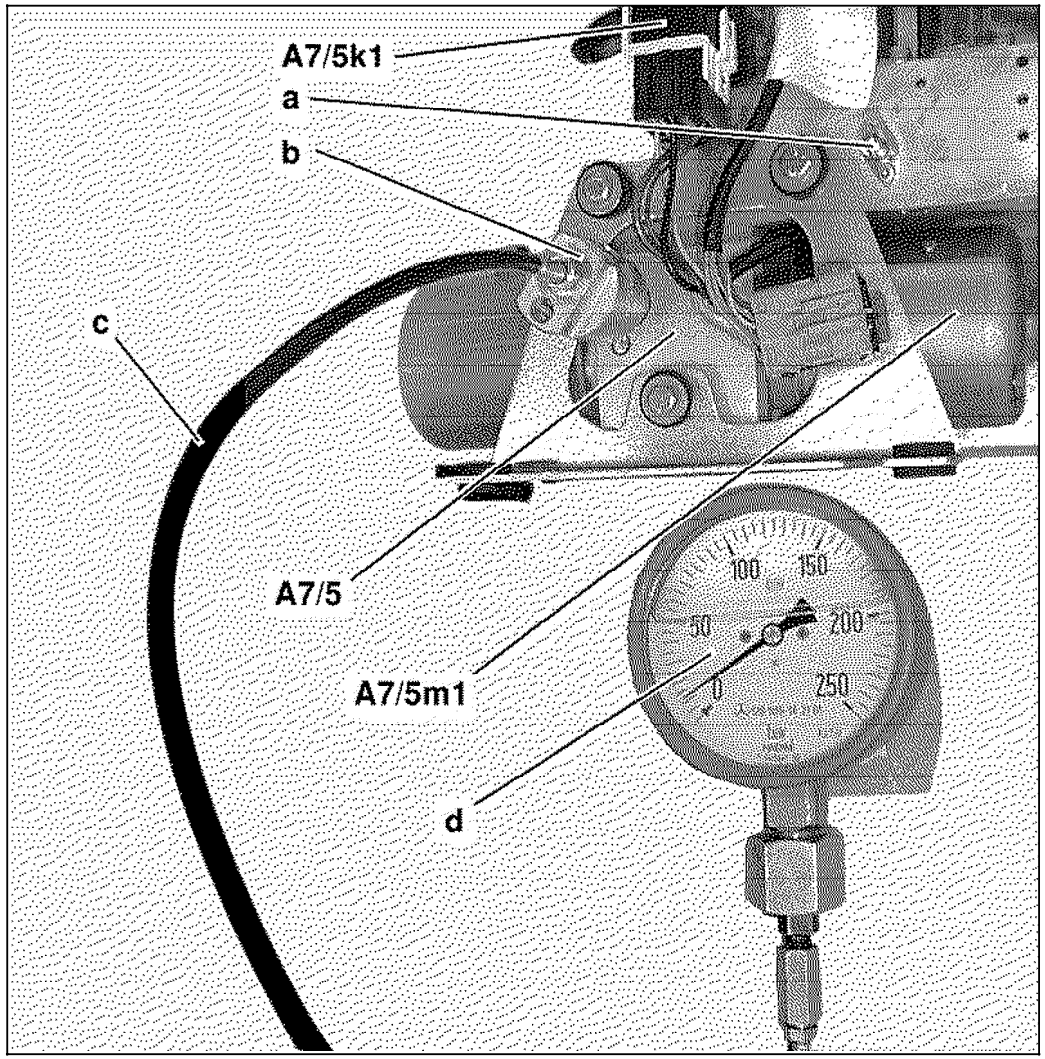
- Ignition: **OFF**
  Disconnect relay (A7/5k1) on the roll bar (RB) hydraulic unit (power soft top) (A7/5) from the relay base.
  Ignition: **ON**
  Operate the RB switch (manual operation) (S83) or power soft top switch (S84) briefly.

Note:
The position of the soft top is of no significance when reducing pressure using the HHT or switches S83 and S84 as mentioned above.

Hydraulic Test Program – Test

Connection of pressure gauge on the roll bar (RB) hydraulic unit (power soft top) (A7/5).

⚠CAUTION!
Route test line "c" carefully out of the trunk and close the trunk lid carefully so that the test line is not pinched.



P77.37-2006-12

A7/5	Rollover bar (RB)/soft top operation hydraulic unit
A7/5k1	Hydraulic unit relay
A7/5m1	Hydraulic unit motor
a	Valve screw for emergency operation of soft top
b	Non-return valve
c	Test line
d	Tester (pressure gauge)

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		Checking system pressure		Ignition: **OFF** Soft top: CLOSED Roll bar: EXTENDED Connector on roll bar (RB) control module (power soft top) (N52) disconnected. Hydraulic unit relay (A7/5k1) disconnected from base. Connect pressure gauge: 33/6		• External leaks: Perform visual inspection ⇒ 1.1
			A7/5k1 2 — 8	Set fuse cable (124 589 37 63 00) with at least 25 A at relay base	Pump runs	
				Read pressure.	approx. 150 bar	

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.1		Internal leaks at hydraulic cylinder, unlock/lock soft top bow		Roll bar: EXTENDED Pressure gauge: CONNECTED Reduce pressure, refer to: 33/5 Soft top bow and soft top compartment cover: RAISED Disconnect hydraulic line 44 (return) on hydraulic cylinder, unlock/lock soft top bow and seal with closing plugs (special tool no. 129 589 00 91 01).		Value OK: • Internal leaks at hydraulic cylinder, unlock/lock soft top bow. Value not OK: ⇒ 1.2
			A7/5k1 2 — 8	Set fuse cable (special tool no. 124 589 37 63 00) with at least 25 A at relay base	Pump runs	
				Read pressure.	approx. 150 bar	

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.2		Internal leaks at hydraulic cylinder, unlock/lock soft top compartment cover		Roll bar: EXTENDED Pressure gauge: CONNECTED Reduce pressure, refer to: 33/5 Soft top bow and soft top compartment cover: RAISED Disconnect hydraulic line 32 (return) on hydraulic cylinder, unlock/lock soft top compartment cover and seal with closing plugs 129 589 00 91 01.		Value OK: • Internal leaks at hydraulic cylinder, unlock/lock soft top compartment cover. Value not OK: • Roll bar (RB) hydraulic unit (power soft top) (A7/5).
			A7/5k1 2 — 8	Set fuse cable (special tool no. 124 589 37 63 00) with at least 25 A at relay base.	Pump runs	
				Read pressure.	approx. 150 bar	