3.4 Model 129 as of 09/95

3.4 Adaptive Damping System (ADS II) with electronic level control

Diagnosis - Function Test

Preliminary testing

Read out DTC, actual/nominal values and perform activations using Hand-Held Tester (HHT).

- **Prior to performing any repairs, read out DTC memory from the ADS control module using the HHT.**

The HHT display indicates the defective components or refers directly to the appropriate test step in the corresponding Diagnostic Manual chapter.

1. Connect the HHT to data link connector (X11/4) as shown section 0.
2. Ignition: **ON**
3. Read DTC memory from ADS control module.
4. Read out nominal/actual value displays.
5. Perform component activations.
6. Perform repairs according to DTC memory readout.
7. After completing repairs erase DTC memory.

Customers which have driveways with extreme approach/exit angles or travel frequently on bad road surfaces may have the vehicle's ADS control module (N51) reprogrammed (see HHT menu selection "Programming") for an increased stage 1 ride height (+15 mm) at vehicle speeds below 35 mph (58 km/h) with the switch **pressed**.
After reprogramming the ride height (as described above), mark the ADS control module with a **red dot** for identification purposes. The stage 2 increased ride height is not affected by this programming change. In any case, the increased ride height is cancelled when the vehicle speed exceeds 37 mph (62 km/h).

3.4 Adaptive Damping System (ADS II) with electronic level control

Diagnosis – Function Test

Component Locations

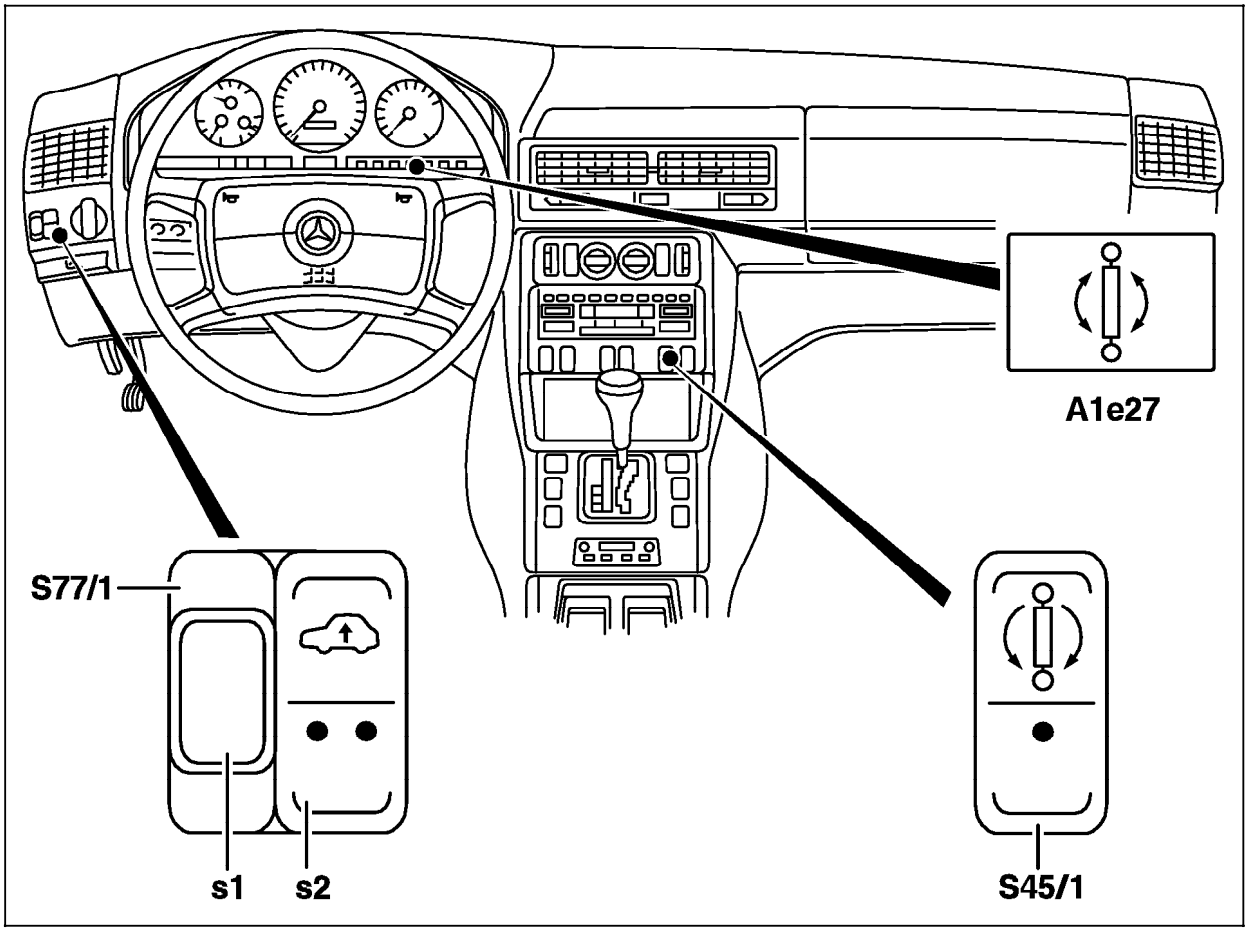

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Figure 1

A1e27	ADS MIL
S45/1	Comfort/sport switch
S77/1	Level adjustment switch
S77/1s1	Level control lock-out switch
S77/1s2	High/normal level control switch

3.4 Adaptive Damping System (ADS II) with electronic level control

Diagnosis – Function Test

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy [1]
⇒ 1.0 ADS MIL (A1e27)	Ignition: **ON** Level adustment switch (S77/1) in position: **normal level**	A1e27: **ON**	Read out DTC memory and actual value display with HHT.
	Engine: **at Idle**	A1e27: **OFF**	Steering angle sensor (N49) not initialized, turn steering wheel from stop to stop. DTC stored: read out DTC memory and actual value display.
⇒ 2.0 Comfort/sport switch (S45/1)	Switch (S45/1) set to: **Sport**	LED in switch (S45/1): **ON**	Read out DTC memory and actual value display.
	Switch (S45/1) set to: **Comfort**	LED in switch (S45/1): **OFF**	Read out DTC memory and actual value display.

[1] Observe Preparation for Test, see 22.

Diagnosis – Function Test

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy [1]
⇒ 3.0 High/normal level control switch (S77/1s2)	Engine: **at Idle** High/normal level control switch (S77/1s2): **normal level**	A1e27: **OFF** LED's in high/normal level control switch (S77/1s2): **OFF**	Read out DTC memory and actual value display.
Raise vehicle level	High/normal level control switch (S77/1s2): **stage 1 raise** (press switch once)	One LED in S77/1s2: **blinks** Vehicle level is raised up to 15 mm. After reaching level, LED remains lit. **Note:** This process occurs slowly. Increase engine speed to 2000 rpm to speed up raising procedure.	32 Hydraulic oil pump. 33 Test leveling valve pressure.
	High/normal level control switch (S77/1s2): **normal level**	Vehicle level lowers. LED's in S77/1s2: **OFF**	
Raise vehicle level	High/normal level control switch (S77/1s2): **stage 2** (press switch twice)	Two LED's in switch: **blink** Vehicle level raised up to 30 mm. After reaching level, LED's remain lit. Note: This process occurs slowly. Increase engine speed to 2000 rpm to speed up raising procedure.	32 Hydraulic oil pump. 33 Test leveling valve pressure.

[1] Observe Preparation for Test, see 22.

3.4 Adaptive Damping System (ADS II) with electronic level control

Diagnosis – Function Test

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy [1]
Hold vehicle level	Ignition: **OFF** 1 minute.	Vehicle remains at raised level.	
⇒4.0 Level control lock-out switch (S77/1s1)	Ignition: **ON**	LED's in high/normal level control switch (S77/1s2): **ON**.	Read out DTC memory and actual value display.
	Press: level control lock-out switch (S77/1s1)	Lamp in S77/1s1: **ON** LED's in high/normal level control switch (S77/1s2): **OFF**	
	Engine: at **Idle**	Lamp in S77/1s1: **ON** LED's in high/normal level control switch (S77/1s2): **OFF**. A1e27 (MIL): **ON**	

[1] Observe Preparation for Test, see 22.

3.4 Adaptive Damping System (ADS II) with electronic level control

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Preparation for DTC Readout

1. Connect Hand-Held Tester (HHT) to data link connector (X11/4) according to connection diagram (see section 0).
2. Ignition: **ON**
3. Read out DTC memory for ADS control module (N51).
4. If no DTC's are stored, perform electrical test 23.

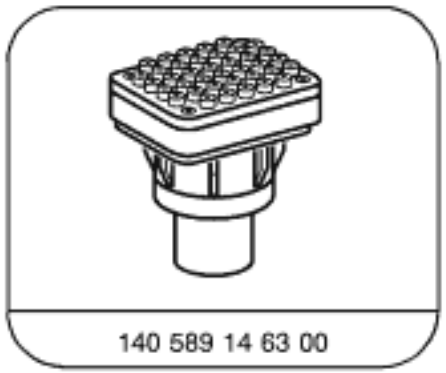
Special Tools

965 589 00 01 00

Hand-Held-Tester

965 589 00 40 00

Test cable



140 589 14 63 00

Adapter

3.4 Adaptive Damping System (ADS II) with electronic level control

Diagnosis - Diagnostic Trouble Code (DTC) Memory

	Possible cause	Test step/Remedy [1]
–	No fault in system.	In case of complaint: 23 (entire test) and 33
C 1000	ADS control module (N51)	Replace N51.
C 1010	Battery low voltage, circuit 87	23 ⇒ 1.0
C 1012	Battery overvoltage, circuit 87	23 ⇒ 1.0
C 1110	Left front VSS signal from traction system control module (N47-1, N47-5), VSS signal status from traction system control module (N47-1, N47-5)	Read out ASR or ESP DTC memory.
C 1121	Left front body acceleration sensor (B24/3)	23 ⇒ 4.0
C 1122	Right front body acceleration sensor (B24/4)	23 ⇒ 4.0
C 1123	Right rear body acceleration sensor (B24/6)	23 ⇒ 4.0
C 1130	Front axle level sensor (B22/2)	23 ⇒ 4.0
C 1131	Rear axle level sensor (B22/3)	23 ⇒ 4.0
C 1140	Steering angle sensor (N49), open/short circuit in sensor, initialization	23 ⇒ 5.0 **Turn steering wheel from stop to stop**
C 1200	Stop lamp switch (S9/1), open/short circuit	Wiring, S9/1
C 1320	Left front axle damper valve assembly, front axle solenoid valve 1 (Y51y1), open/short circuit	23 ⇒ 7.0

[1] Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

	Possible cause	Test step/Remedy [1]
C 1321	Left front axle damper valve assembly, front axle solenoid valve 2 (Y51y2), open/short circuit	23 ⇒ 7.0
C 1322	Right front axle damper valve assembly, front axle solenoid valve 1 (Y52y1), open/short circuit	23 ⇒ 8.0
C 1323	Right front axle damper valve assembly, front axle solenoid valve 2 (Y52y2), open/short circuit	23 ⇒ 8.0
C 1324	Left rear axle damper valve assembly, rear axle solenoid valve 1 (Y53y1), open/short circuit	23 ⇒ 9.0
C 1325	Left rear axle damper valve assembly, rear axle solenoid valve 2 (Y53y2), open/short circuit	23 ⇒ 9.0
C 1326	Right rear axle damper valve assembly, rear axle solenoid valve 1 (Y54y1), open/short circuit	23 ⇒ 10.0
C 1327	Right rear axle damper valve assembly, rear axle solenoid valve 2 (Y54y2), open/short circuit	23 ⇒ 10.0
C 1328	Valve (raise front axle) (Y36/6y1), open/short circuit	23 ⇒ 11.0
C 1329	Valve (raise rear axle) (Y36/6y2), open/short circuit	23 ⇒ 11.0

[1] Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

	Possible cause	Test step/Remedy [1]
C 1330	Valve (lower front axle) (Y36/6y3), open/short circuit	23 ⇒ 11.0
C 1331	Valve (lower rear axle) (Y36/6y4), open/short circuit	23 ⇒ 11.0
C 1505	ADS MIL (A1e27) open/short circuit	23 ⇒ 3.0
C 1506	Comfort/Sport switch (S45/1), open/short circuit	Wiring, S45/1
C 1507	Level adjustment switch (S77), open/short circuit	Wiring, S77
C 1508	Level adjustment switch (S77), lock-out activated	
C 1509	Vehicle front axle level too low	
C 1510	Hydraulic fault, Rear axle "lower" valve activation time too long, Hydraulic fault, Front axle "lower" valve activation time too long, Hydraulic fault, Rear axle "raise" valve activation time too long, Hydraulic fault, Front axle "raise" valve activation time too long	

[1] Observe Preparation for Test, see 22.

3.4 Adaptive Damping System (ADS II) with electronic level control

Diagnosis - Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Test step/Remedy [1]
ADS MIL (A1e27) comes on with engine running	Steering angle sensor (N49) not initialized DTC stored	Turn steering wheel from right to left stop. Read out DTC memory.
Damping too hard/too soft		Read out DTC memory. 35 ⇒ 1.0
Vehicle (default) level too low		Please refer to: WIS Job Nos. AR40.20-P-0300C, AR40.20-P-0301C, AR40.20-P-0301D
Vehicle lowers with engine off		Read out DTC memory. Visually check for external leaks. 34 35
Vehicle lowers at front axle		Read out DTC memory. Visually check for external leaks. 34

[1] Observe Preparation for Test, see 22.

3.4 Adaptive Damping System (ADS II) with electronic level control

Diagnosis - Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Test step/Remedy [1]
Vehicle lowers at rear axle		Read out DTC memory. Visually check for external leaks. 35
Vehicle does not raise at one or both axles		Read out DTC memory. Visually check for external leaks. 33 37 34 35
Hydraulic oil level too low		Visually check for external leaks.

[1] Observe Preparation for Test, see 22.

3.4 Adaptive Damping System (ADS II) with electronic level control

Electrical Test Program – Component Locations

Electrical Components

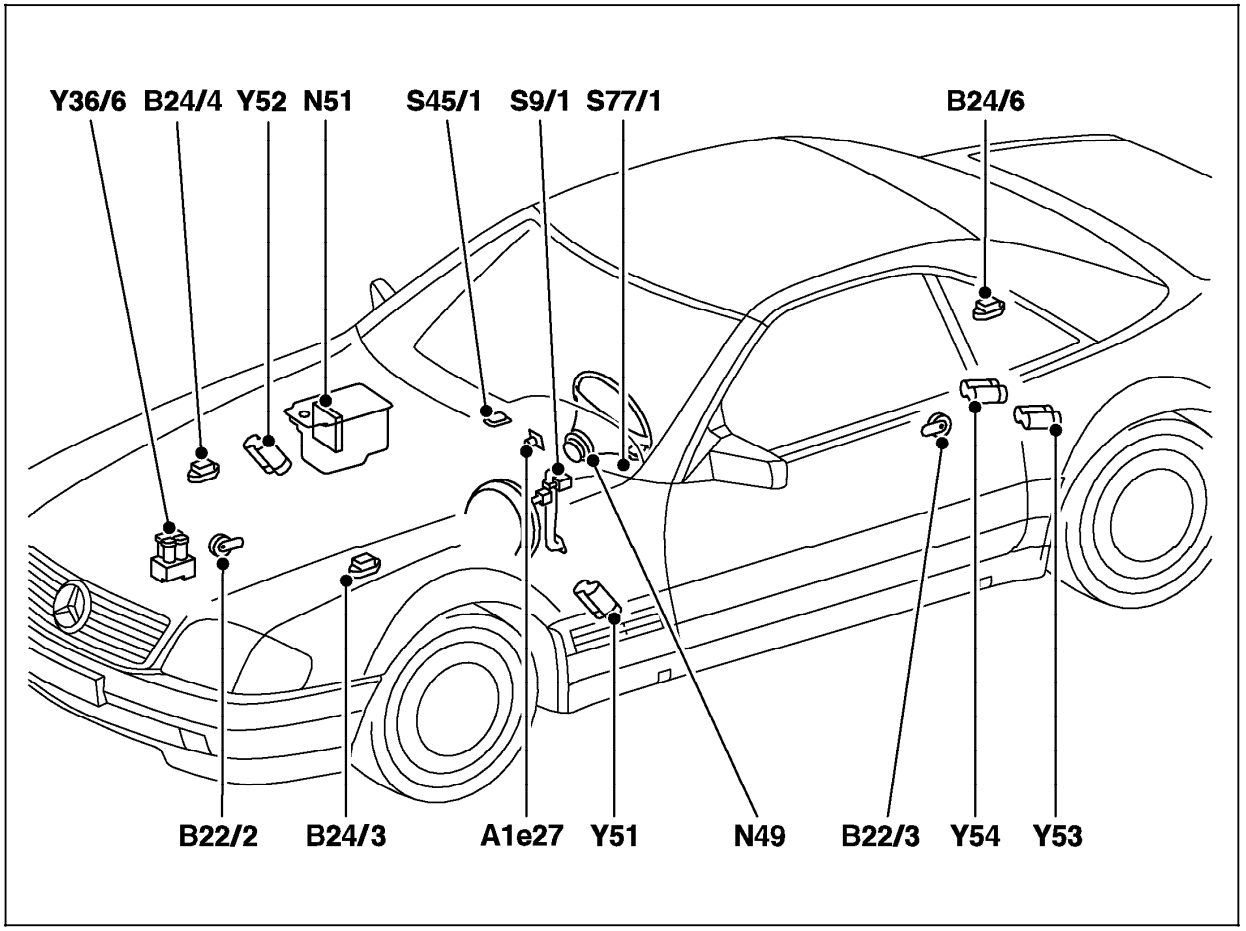


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Figure 1

A1e27	ADS MIL
B22/2	Front axle level sensor
B22/3	Rear axle level sensor
B24/3	Left front body acceleration sensor
B24/4	Right front body acceleration sensor
B24/6	Right rear body acceleration sensor
N49	Steering angle sensor
N51	ADS control module
S9/1	Stop lamp switch (4-pole)
S45/1	Comfort/sport switch (ADS)
S77/1	Level adjustment switch
Y36/6	Rear axle height reduction valve
Y51	Left front axle damper valve assembly
Y52	Right front axle damper valve assembly (mirror image of Y51)
Y53	Left rear axle damper valve assembly
Y54	Right rear axle damper valve assembly (mirror image of Y53)

3.4 Adaptive Damping System (ADS II) with electronic level control

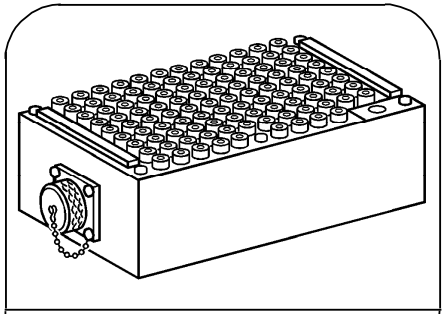
Electrical Test Program – Preparation for Test

1. Ignition: **OFF**
2. Remove ADS control module (N51) (Figure 1).
3. Remove bolts (a) and frame (b).
4. Unclip electrical connecter (c, arrows) at frame (b) and remove.
5. Connect socket box and test cables (Figure 2).

Electrical wiring diagrams:
Electrical Troubleshooting Manual, Model 129, Volume 1, Group 00 and 32.

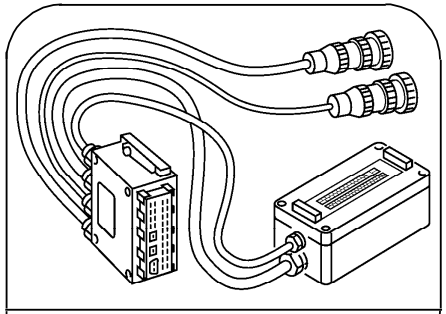
Note:
An ADS control module (N51) marked with a red paint dot has been reprogrammed. Upon replacement, the level must be checked, adjusted, and new control module must be reprogrammed using the HHT (refer to 11 and HHT menu selection "Programming"). After reprogramming control module, mark control module with red paint dot for identification purposes.

Special Tools



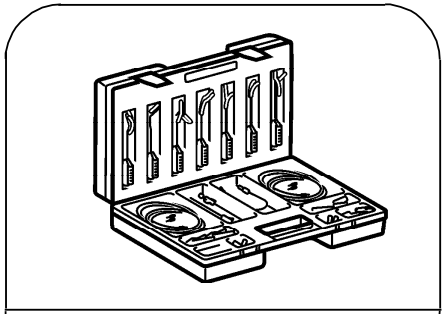
129 589 00 21 00

126-pin socket box



140 589 39 63 00

Test cable for module 6



201 589 00 99 00

Electrical connecting set

Test equipment; See MBUSA Standard Service Equipment Program

Description	Brand, model, etc.
Digital multimeter	Fluke models 23, 77 III, 83, 85, 87

Electrical Test Program – Preparation for Test

Removing/replacing control module (N51)

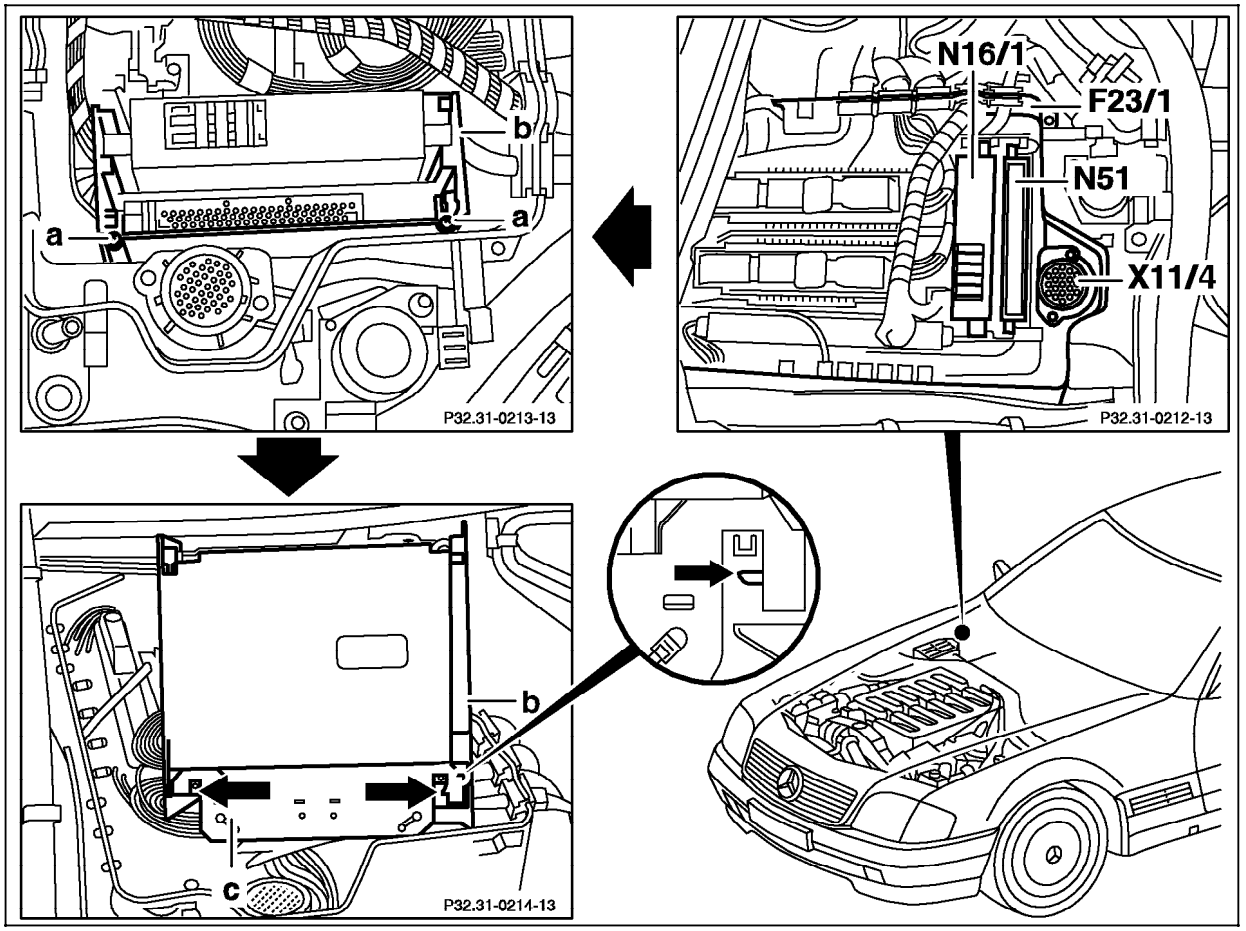


Figure 1

a Bolts
b Mounting frame
c Connector
N51 ADS control module

Electrical Test Program – Preparation for Test

Connection Diagram – Socket Box

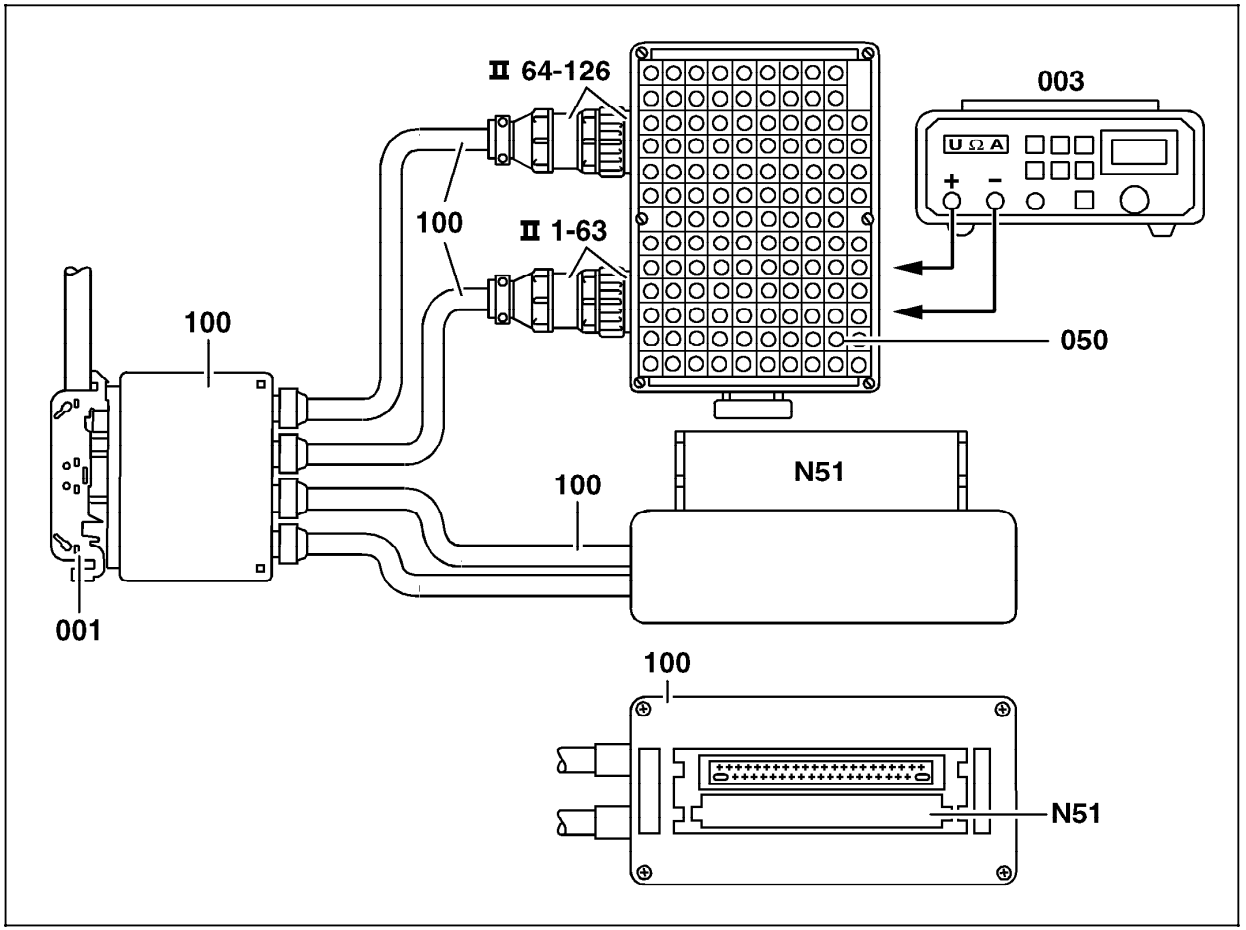


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Figure 2

001 Control module connector
003 Digital multimeter
050 Socket box (126-pole)
100 Test cable
N51 ADS control module

3.4 Adaptive Damping System (ADS II) with electronic level control

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	C 1000 C 1010 C 1012	**ADS control module (N51)** Circuit 87 SA Voltage supply	N51 35 — 26	Ignition: **ON**	11 – 14 V	⇒ 1.1, W16, Wiring.
1.1		Voltge supply from base module (N16/1)	N51 ⊥ — 26	Ignition: **ON**	11 – 14 V	Fuse (F3) at N16/1, 1.1 or 23, Wiring.
2.0		**Diagnosis output**	N51 35 — 25	Ignition: **ON**	10 – 14 V	Wiring, ADS control module (N51).
3.0	C 1505	**ADS MIL (A1e27)**	N51 35 — 8	Ignition: **OFF** Disconnect N51. Ignition: **ON**	11 – 14 V	Wiring, A1e27.
4.0	C 1121 C 1122 C 1123 C 1130 C 1131	**Voltage supply** Body acceleration sensors (B24/3, B24/4, B24/6) Front, rear axle level sensors (B22/2, B24/3)	N51 30 — 29	Ignition: **ON**	4.75 - 5.25 V	ADS control module (N51).

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.0	C 1140	**Steering angle sensor (N49)** Voltage supply circuit 30	N49x1 2 — (— V —) — 4	Ignition: **OFF** Disconnect steering angle sensor connector (N49x1).	11 - 14 V	Wiring.
5.1		Voltage supply circuit 87	N49x1 2 — (— V —) — 3	Ignition: **ON**	11 - 14 V	Wiring.
6.0	C 1140	**Steering angle sensor** Initialization		Engine: **at Idle** Turn steering wheel from right to left stop.	A1e27 goes out.	⇒ 5.0

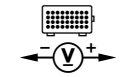
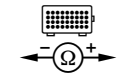
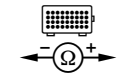
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
7.0	C 1320 C 1321	**Left front axle damper valve assembly (Y51)** Voltage supply	N51 35 — (V) — 19	Ignition: **ON**	11–14 V	Wiring, ADS control module (N51).
7.1	C 1320	Front axle solenoid valve 1 (Y51y1)	N51 39 — (Ω) — 19	Ignition: **OFF** Disconnect N51.	10 – 16 Ω	Wiring, Y51
7.2	C 1321	Front axle solenoid valve 2 (Y51y2)	N51 40 — (Ω) — 19	Ignition: **OFF** Disconnect N51.	10 – 16 Ω	Wiring, Y51

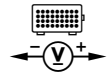
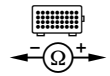
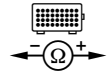
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
8.0	1322 1323	**Right front axle damper valve assembly (Y52)** Voltage supply	N51 35 — (— V —) — 21	Ignition: **ON**	11–14 V	Wiring, ADS control module (N51).
8.1	1322	Front axle solenoid valve 1 (Y52y1)	N51 41 — (— Ω —) — 21	Ignition: **OFF** Disconnect N51.	10 – 16 Ω	Wiring, Y52
8.2	1323	Front axle solenoid valve 2 (Y52y2)	N51 22 — (— Ω —) — 21	Ignition: **OFF** Disconnect N51.	10 – 16 Ω	Wiring, Y52

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
9.0	C 1324 C 1325	**Left rear axle damper valve assembly (Y53)** Voltage supply	N51  35 — 31	Ignition: **ON**	11–14 V	Wiring, ADS control module (N51).
9.1	C 1324	Rear axle solenoid valve 1 (Y53y1)	N51  24 — 31	Ignition: **OFF** Disconnect N51.	10 – 16 Ω	Wiring, Y53
9.2	C 1325	Rear axle solenoid valve 2 (Y53y2)	N51  3 — 31	Ignition: **OFF** Disconnect N51.	10 – 16 Ω	Wiring, Y53

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
10.0	C1326 C1327	**Right rear axle damper valve assembly (Y54)** Voltage supply	N51 35 — () — 2	Ignition: **ON**	11–14 V	Wiring, ADS control module (N51).
10.1	C1326	Rear axle solenoid valve 1 (Y54y1)	N51 23 — () — 2	Ignition: **OFF** Disconnect N51.	10 – 16 Ω	Wiring, Y54
10.2	C1327	Rear axle solenoid valve 2 (Y54y2)	N51 1 — () — 2	Ignition: **OFF** Disconnect N51.	10 – 16 Ω	Wiring, Y54

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
11.0	C 1328 C 1329 C 1330 C 1331	**Rear axle height reduction valve (Y36/6)** Voltage supply	N51  35 — 37	Ignition: **ON**	11–14 V	Wiring, ADS control module (N51).
11.1	C 1328	Valve (raise front axle) (Y36/6y1)	N51  16 — 37	Ignition: **OFF** Disconnect N51.	7.5 – 12 Ω	Wiring, Y36/6y1
11.2	C 1329	Valve (raise rear axle) (Y36/6y2)	N51  20 — 37	Ignition: **OFF** Disconnect N51.	7.5 – 12 Ω	Wiring, Y36/6y2
11.3	C 1330	Valve (lower front axle) (Y36/6y3)	N51  11 — 37	Ignition: **OFF** Disconnect N51.	7.5 – 12 Ω	Wiring, Y36/6y3
11.4	C 1331	Valve (lower rear axle) (Y36/6y4)	N51  12 — 37	Ignition: **OFF** Disconnect N51.	7.5 – 12 Ω	Wiring, Y36/6y4

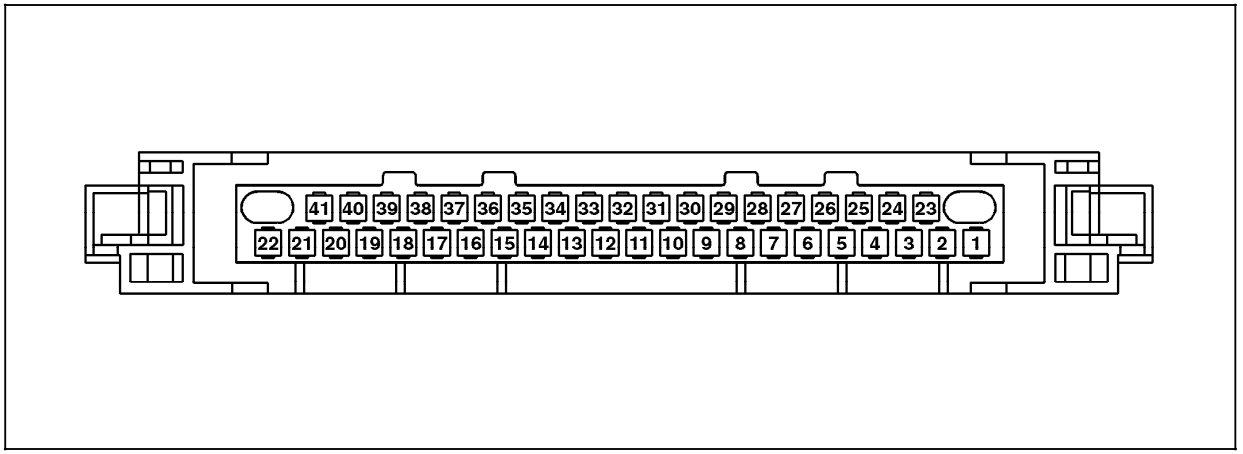
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
12.0		**Circuit 30 voltage supply**	N51 35 — (– V +) — 32	Engine: **OFF**	II – I4 V	Fuse 23 in fuse and relaly box F1, Wiring.

3.4 Adaptive Damping System (ADS II) with electronic level control

Electrical Test Program – Test

Connector Layout - ADS Control Module (N51)



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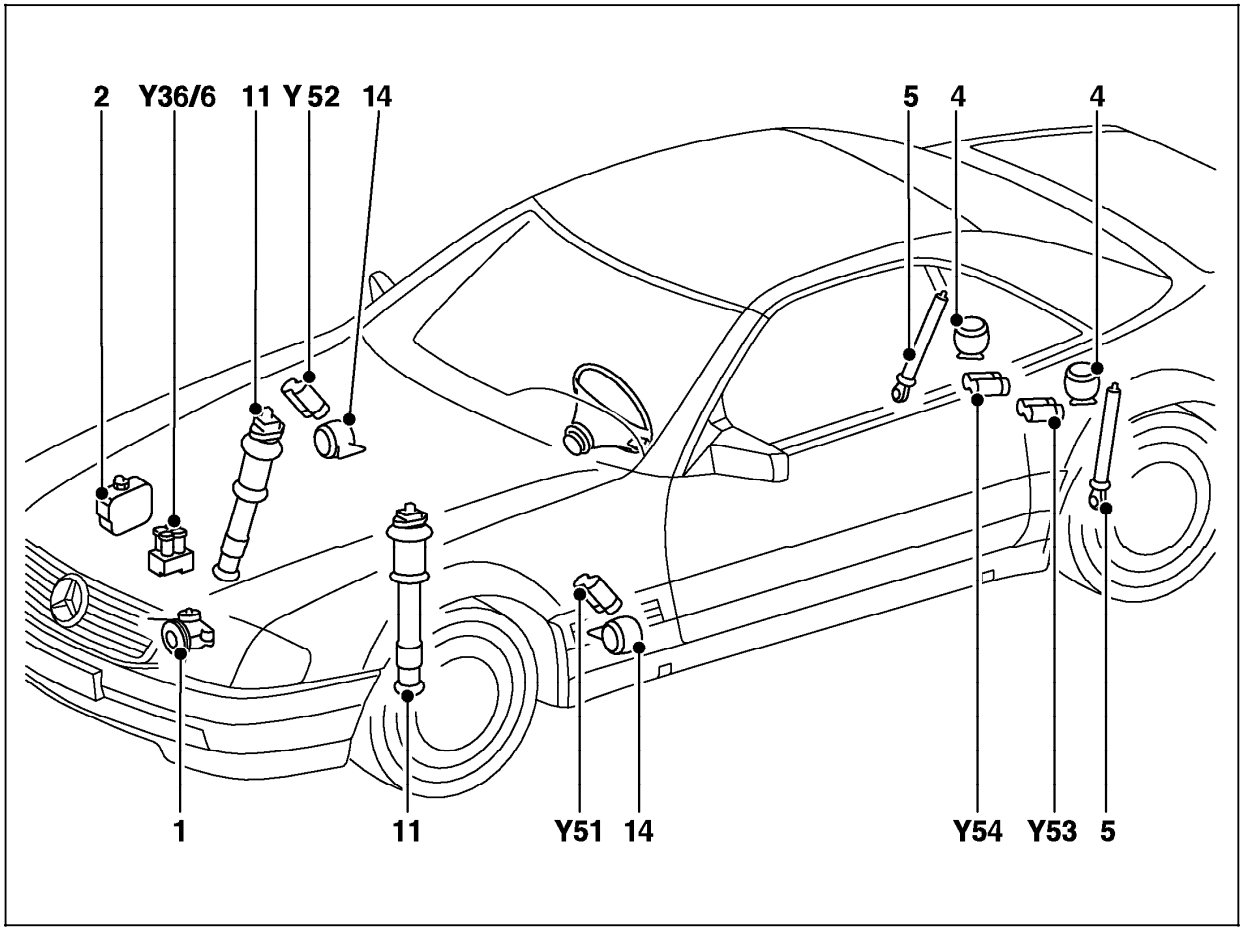
F23/1	Control module box	15	Left front body lateral acceleration sensor (B24/3) (signal)	29	Voltage supply for sensors
1	Rear axle solenoid valve 2 (Y54y2) (–)	16	Valve (raise front axle) (Y36/6y1)	30	Ground for sensors
2	Rear axle solenoid valve 1 (Y54y1, Y54y2) (+)	17	Front axle level sensor (B22/2) (signal 2)	31	Rear axle solenoid valves (Y53y1, Y53y2) (+)
3	Rear axle solenoid valve 2 (Y53y2) (–)	18	Rear axle level sensor (B22/3) (signal 2)	32	Circuit 30
4	Steering angle sensor (N49)	19	Front axle solenoid valve 1 (Y51y1, Y51y2) (+)	33	Processed right front VSS signal from traction system control module (N47-1 or N47-2 or N47-5)
5	Processed left front VSS signal from traction system control module (N47-1 or N47-2 or N47-5)	20	Valve (raise rear axle) (Y36/6y2)	34	Right front body lateral acceleration sensor (B24/4) (signal)
6	Comfort/sport switch (S45/1), indicator lamp LED	21	Front axle solenoid valve2 (Y52y1, Y52y2) (+)	35	Ground, component compartment (W16)
7	Stop lamp switch (S9/1) (4-pole)	22	Front axle solenoid valve 2 (Y52y2) (–)	36	Level adjustment switch (S77/1) LED stage 1
8	ADS MIL (A1e27)	23	Rear axle solenoid valve 1 (Y54y1) (–)	37	Voltage supply for level control valves
9	Right rear body lateral acceleration sensor (B24/6) signal	24	Rear axle solenoid valve 1 (Y53y1) (–)	38	Circuit 61
10	Level adjustment switch (S77/1) (signal)	25	Diagnosis output	39	Front axle solenoid valve 1 (Y51y1) (–)
11	Valve (lower front axle) (Y36/6y3)	26	Circuit 87 voltage supply	40	Front axle solenoid valve 2 (Y51y2) (–)
12	Valve (lower rear axle) (Y36/6y4)	27	Comfort/sport switch (S45/1)	41	Front axle solenoid valve 1 (Y52y1) (–)
13	Front axle level sensor (B22/2) (signal 1)	28	Level adjustment switch (S77/1) LED stage 2		
14	Rear axle level sensor (B22/3) (signal 1)				

3.4 Adaptive Damping System (ADS II) with electronic level control

Hydraulic Test Program – Component Locations

Hydraulic components



P32.31-0238-06

Figure 1

1	Hydraulic oil pump
2	Hydraulic oil reservoir
4	Rear pressure reservoir
5	Rear ADS suspension strut
11	Front ADS suspension strut
14	Front pressure reservoir
Y36/6	Level adjustment valve
Y51	Left front axle damper valve assembly
Y52	Right front axle damper valve assembly
Y53	Left rear axle damper valve assembly
Y54	Right rear axle damper valve assembly

3.4 Adaptive Damping System (ADS II) with electronic level control

Hydraulic Test Program – Hydraulic Oil Pump Test

Preparation for Test

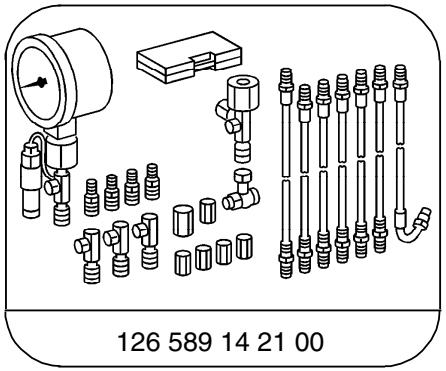
1. Depressurize rear axle hydraulic system by slowly opening bleeder screw (57a).
2. Connect test gauge (038) with hose (038e) to rear axle distribution fitting (57) in place of bleed screw (57a).
3. Check oil level in oil reservoir, correct if necessary.

To perform this rest, the oil fill quantity must be increased by 0.5 liters. If the oil reservoir was empty, the hydraulic oil pump must first be bled by disconnecting the high pressure flexible hose at the steel line. Run the engine and hold the hose into a container until the oil exits free of bubbles.

4. Connect HHT (refer to section 0).
5. Disconnect return line (T) at oil reservoir (2) and using a suitable hose (061), hold it in a measuring glass.

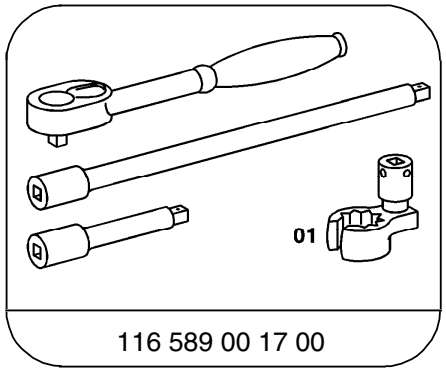
Monitor oil level during testing, air **must not** be allowed to enter the system through the hydraulic pump.

Special Tools



126 589 14 21 00

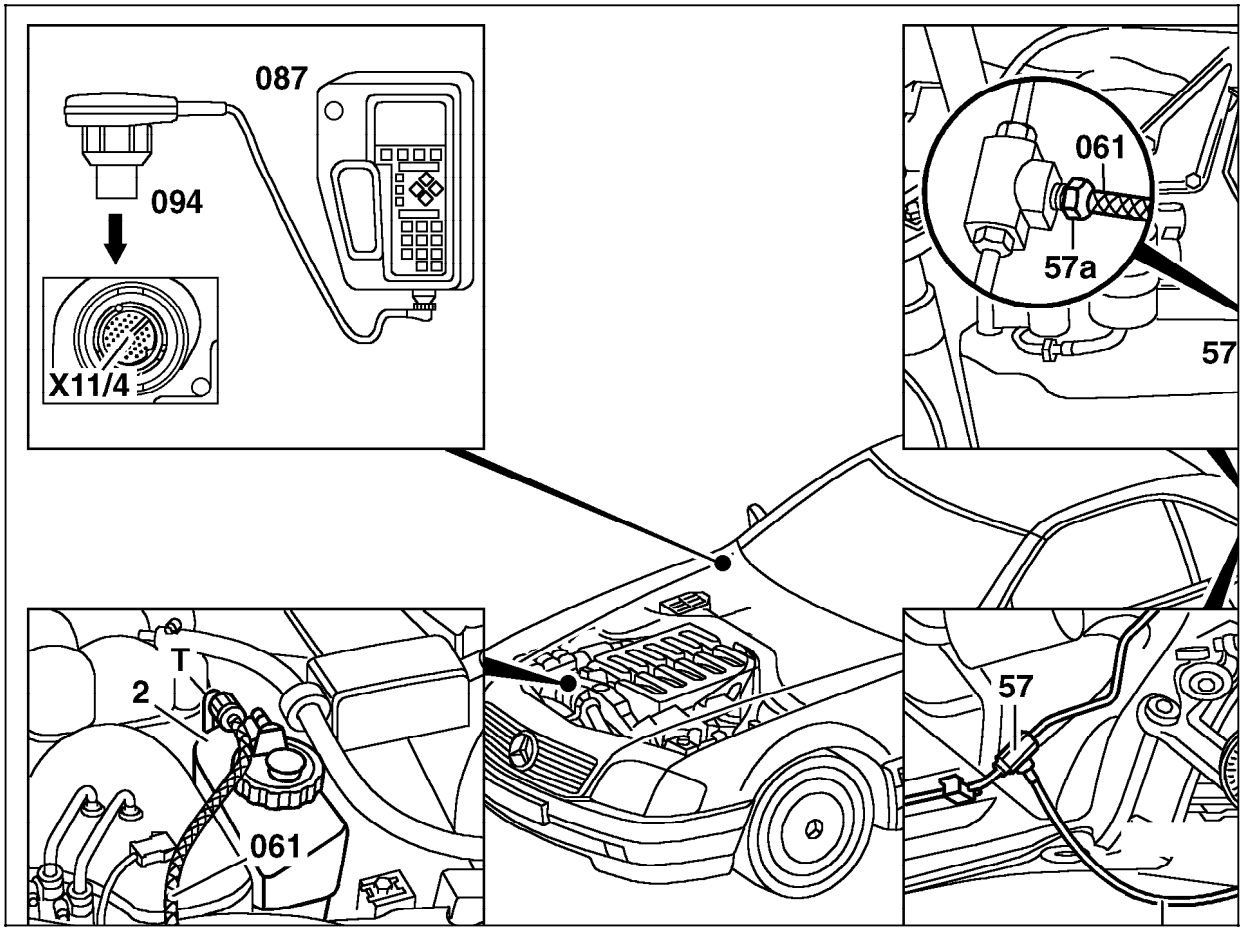
Tester



116 589 00 17 00

Box wrench

Hydraulic Test Program – Hydraulic Oil Pump Test



P32.31-0243-06

Figure 1

2	Hydraulic oil reservoir
038	Test gauge
038e	Hydraulic test hose
57	Distribution fitting
57a	Bleed screw
061	Bleed hose
087	HHT
094	Multiplexer test cable 965 589 00 40
X11/4	Data link connctor

Hydraulic Test Program - Hydraulic Oil Pump Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		**Hydraulic oil pump** Delivery pressure ⚠ **WARNING!** High pressure	250 bar at rear axle distribution fitting.	Engine: **at Idle**. HHT activation: **raise** Observe test gauge needle until pressure no longer increases.	> 180 - 190 bar delivery capacity at idle > 0.2 l/min.	Delivery pressure < 180 bar, Delivery capacity < 0.2 l/min: Replace hydraulic oil pump Delivery pressure < 180 bar, Delivery capacity > 0.2 l/min: Replace leveling valve.

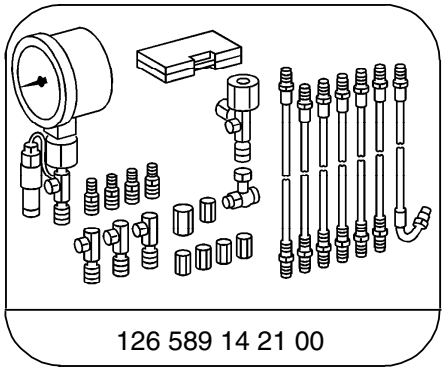
3.4 Adaptive Damping System (ADS II) with electronic level control

Hydraulic Test Program – Leveling Valve Pressure Test

Preparation for Test

1. Depressurize rear axle hydraulic system by slowly opening bleed screw (57a).
2. Connect test gauge (038) with hose (038e) to distribution fitting (57) in place of bleed screw (57a).
3. Check oil level in oil reservoir, correct if necessary.
4. Connect HHT (refer to section 0).

Special Tools



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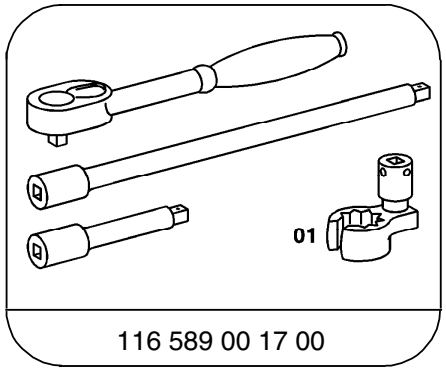
Tester

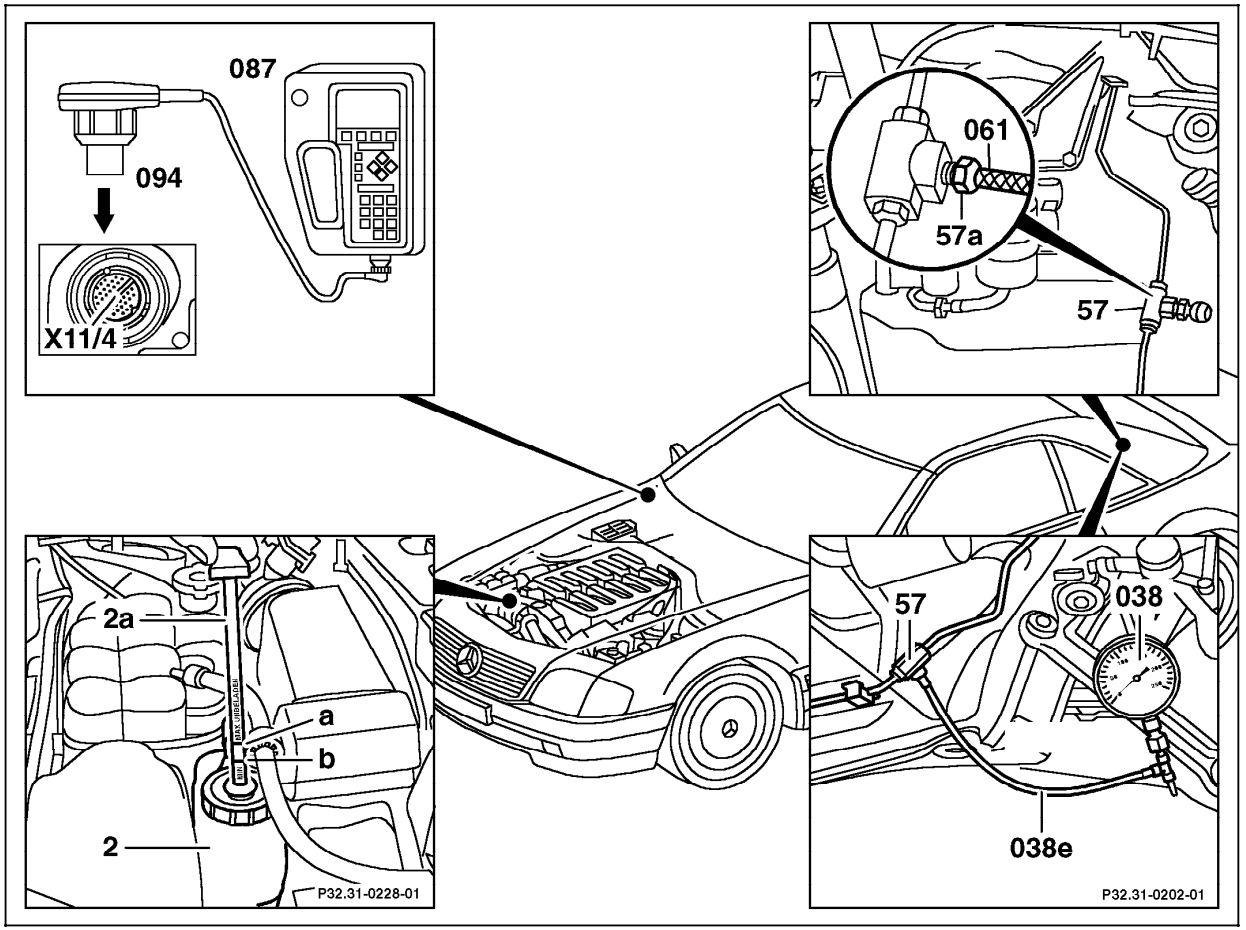


116 589 00 17 00

Box wrench

Monitor oil level during testing, air **must not** be allowed to enter the system through the hydraulic pump.

Hydraulic Test Program – Leveling Valve Pressure Test



P32.31-0246-06

Figure 1

2	Hydraulic oil reservoir
2a	Dipstick
a	Max. level
b	Min. level
57	Distribution fitting
57a	Bleed screw
061	Bleed hose
087	HHT
094	Multiplexer test cable 965 589 00 40
X11/4	Data link connector

Hydraulic Test Program – Leveling Valve Pressure Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		**Leveling valve** Opening pressure Relief valve	⊘ 250 bar at rear axle distribution fitting	Engine: **at Idle** HHT activation: **raise**	180 - 190 bar	Delivery pressure > 190 bar Replace leveling valve. Delivery pressure < 180 bar Hydraulic pump test 32.
		Overflow valve		HHT activation: **lower** (5 min)	33-36 bar after 5 min.	Replace leveling valve.

3.4 Adaptive Damping System (ADS II) with electronic level control

Hydraulic Test Program – Internal Leakage Test, Front Axle Circuit

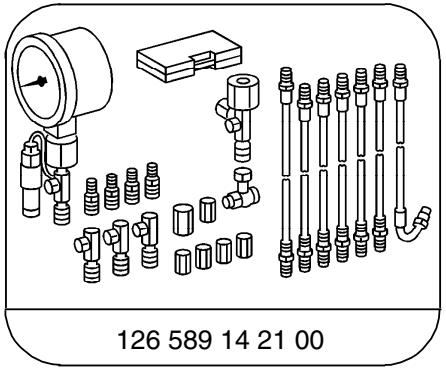
Preparation for Test

Note:

- Test only if rear axle vehicle level drops or does not raise.
- Test with vehicle weight on all 4 wheels.
- Test with vehicle at normal level.

1. Switch on level control lock-out switch (S77/1s1) (switch should illuminate).
2. Check oil level in oil reservoir (2), correct if necessary.
3. Disconnect overflow oil return line (LL/LR) for suspension strut (11) at connecter (arrow).
4. Connect coupling (038f) and bleeder screw (038n) to steel hydraulic line.
5. Disconnect return line (T) at oil reservoir (2), connect a suitable hose (061) and hold it in a measuring container.

Special Tools



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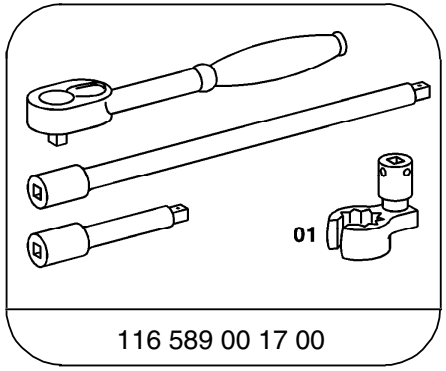
Tester



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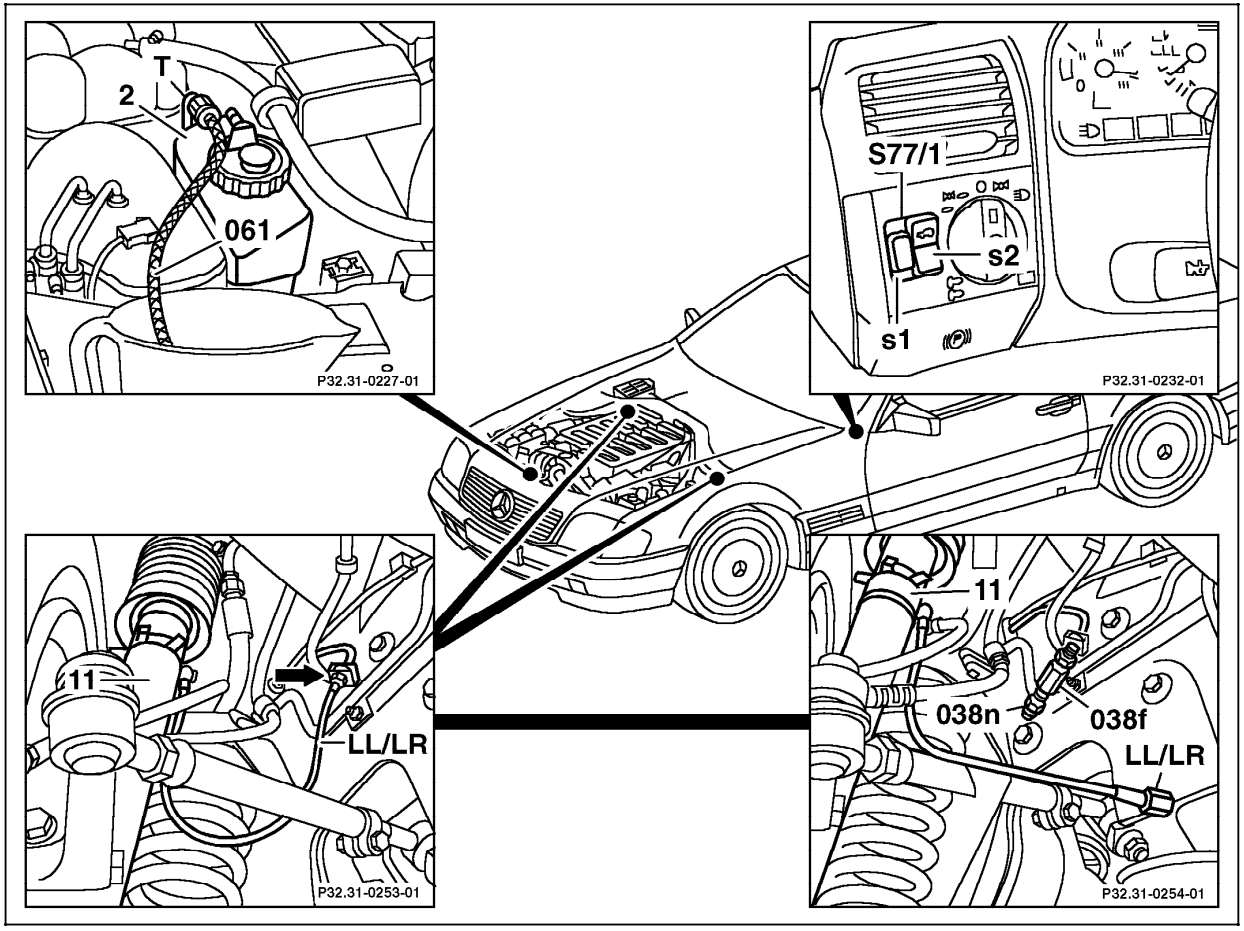
Box wrench

Hydraulic Test Program - Internal Leakage Test, Front Axle Circuit



P32.31-0245-06

Figure 1

2	Hydraulic oil reservoir
11	ADS strut
038f	Coupler (from hydraulic kit)
038n	Bleed screw (from hydraulic kit)
061	Return line
LL	Overflow oil retrun hose for left ADS strut, front axle leveling valve
LR	Overflow oil retrun hose for right ADS strut, front axle leveling valve
T	Leveling valve return line

Hydraulic Test Program - Internal Leakage Test, Front Axle Circuit

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		**Internal leakage of leveling valve** Overflow quantity of suspension strut.	Measuring container.	Overflow oil return hose (LL and LR) in measuring container.	Total overflow oil quantity: 2 cc in 4 hrs.	Replace ADS strut.
		Leveling valve	Measuring container.	Oil return line in measuring container.	Oil return flow should stop after 5 min.	Replace leveling valve.

Hydraulic Test Program – Internal Leakage Test, Rear Axle Circuit

Preparation for Test

Note:

- Test only if rear axle vehicle level is low or does not raise.
- Test with vehicle weight on all 4 wheels.
- Test with vehicle at normal level.

1. Press level control lock-out switch (S77/1s1) (lamp in switch illuminates).
2. Check oil level in oil reservoir, correct if necessary.
3. Disconnect return line (T) at oil reservoir (2), connect suitible hose (061) and hold it in measuring container.

Hydraulic Test Program – Internal Leakage Test, Rear Axle Circuit

Component Locations

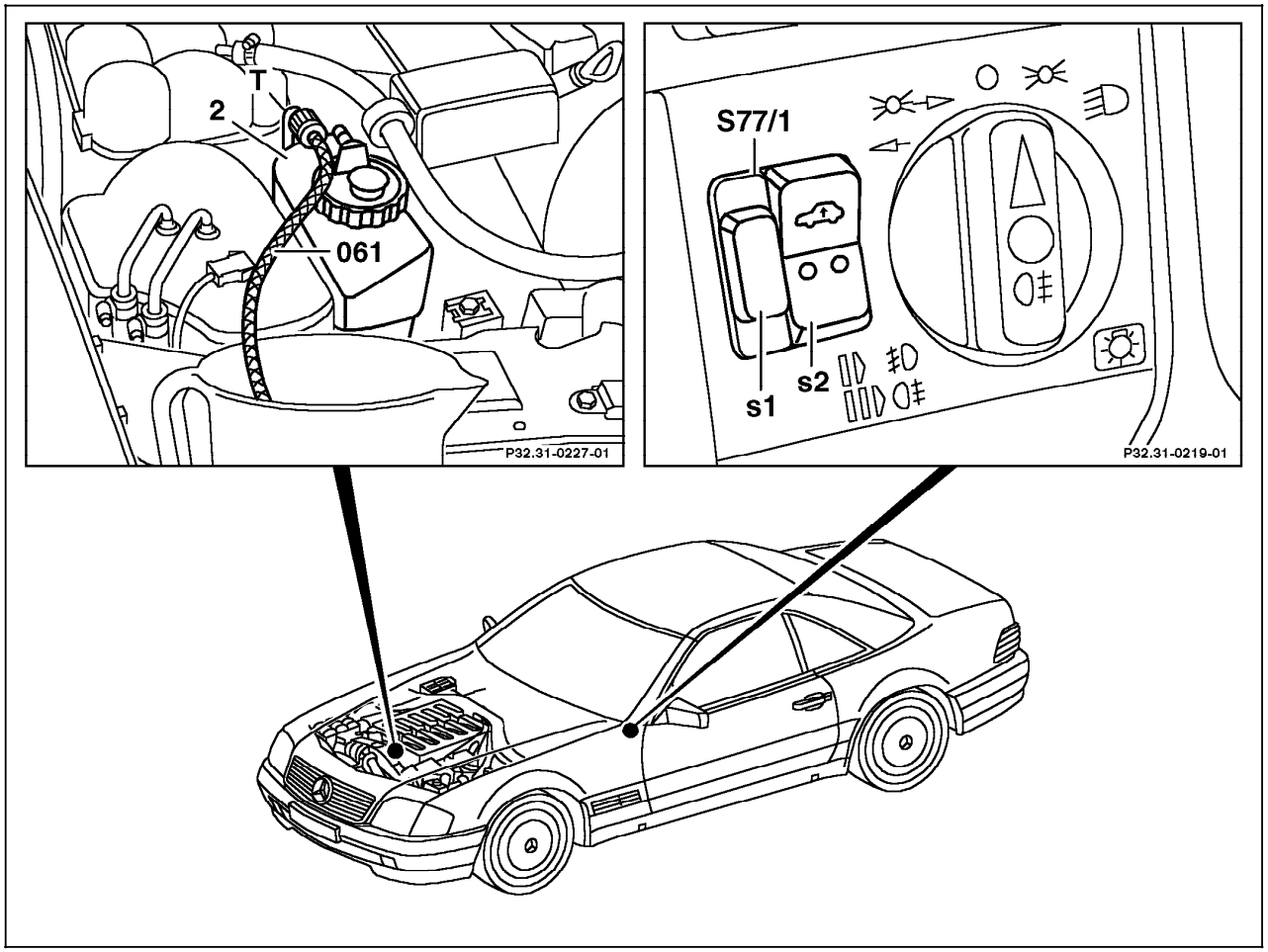


Figure 1

P32.31-0244-06

2	Hydraulic oil reservoir
061	Oil return hose
T	Return line levelling valve - oil reservoir
S77/1	Level adjustment switch

Hydraulic Test Program – Internal Leakage Test, Rear Axle Circuit

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		**Leveling valve** Rear axle valves	Measuring container	Hold return line in measuring cup	Return flow should stop after 5 min.	Replace leveling valve.

3.4 Adaptive Damping System (ADS II) with electronic level control

Hydraulic Test Program – Damping Test

Preparation for Test

1. Check oil level in oil reservoir, correct if necessary.
2. Connect HHT (refer to section 0).

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		**Damping valves**		Activate Comfort/Sport setting. Test all four damping valves by manually rocking vehicle at respective wheel.	Difference between **hard/soft** damping must be clearly noticeable.	Read out DTC's Damping valves.

Hydraulic Test Program – Vehicle Level Test

Preparation for Test

1. Check oil level in oil reservoir, correct if necessary.

   Note:
   Set vehicle level to normal.

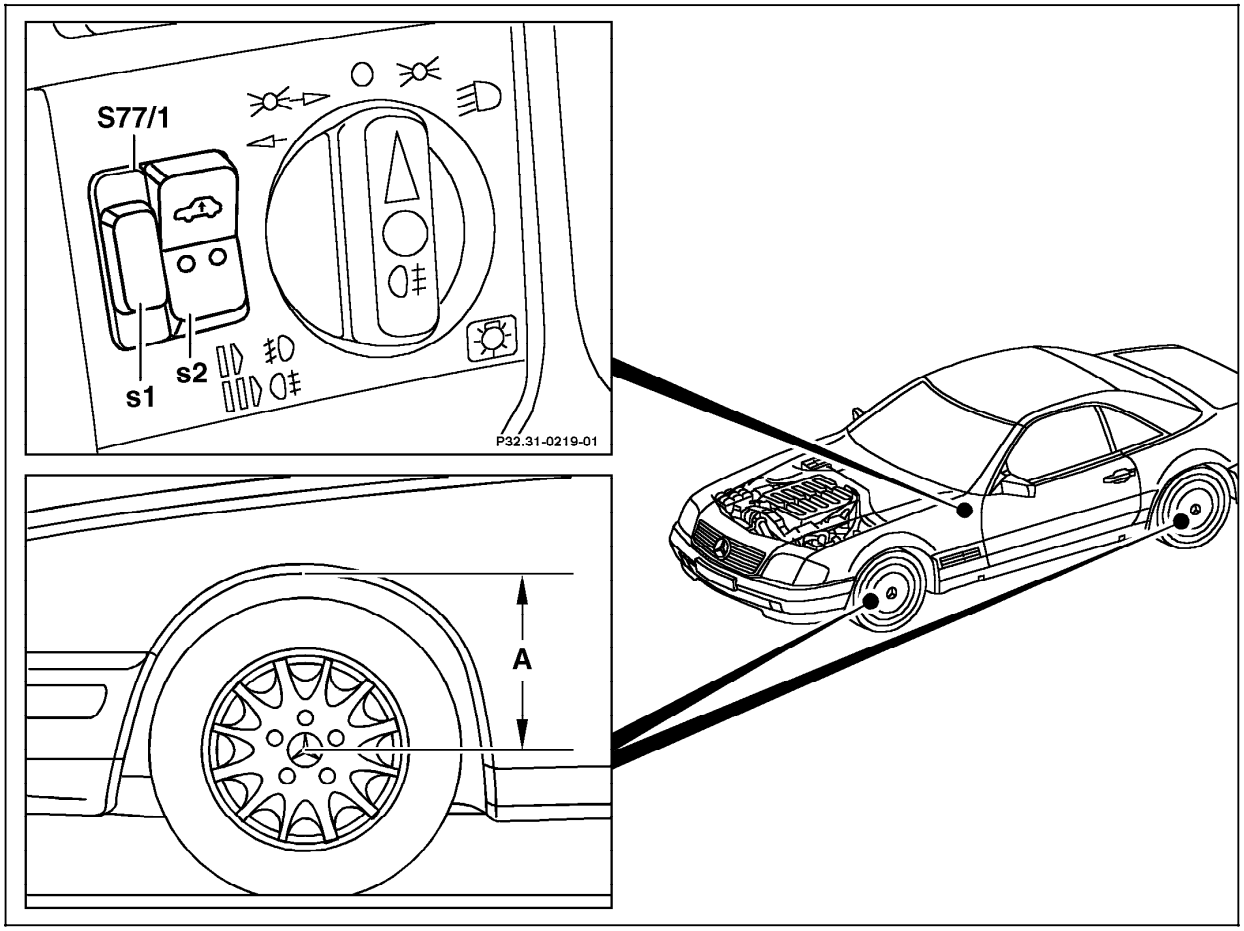


Figure 1

S77/1 Level adjustment switch
s1 Lock-out switch
s2 High/normal level control switch
A Distance from center of wheel to top fender well

P32.31-0269-06

Hydraulic Test Program – Vehicle Level Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		**Normal level**	Level control raise/lower switch (S77/1s2)	Engine: **at idle** LED's in switch: **OFF** Measure and record distance A at front and rear axle.		
		Vehicle level at stage 1		S77/1s2 in position: **raise level stage 1** (press switch 1X). As soon as LED in switch is constantly lit: Measure and record distance **A** (Figure 1) at front and rear axle.	Vehicle height increase: +15 mm at front axle +15 mm at rear axle	Leveling Valve Pressure Test 33 (if no change in level is noted at front or rear of vehicle). Internal Leakage Test, Front Axle Circuit 34 Internal Leakage Test, Rear Axle Circuit 35
		Vehicle level at stage 2		S77/1s2 in position: **raise level stage 2** (press switch 2X). As soon as LED in switch is constantly lit: Measure and record distance **A** (Figure 1) at front and rear axle.	Vehicle height increase: +15 mm at front axle +15 mm at rear axle (Total level change =30 mm)	Leveling Valve Pressure Test 33 (if no change in level is noted at front or rear of vehicle). Internal Leakage Test, Front Axle Circuit 34 Internal Leakage Test, Rear Axle Circuit 35

Hydraulic Test Program – Vehicle Level Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
		Normal level		S77/1s2 in position: **Normal level** (press switch down 2x) As soon as LED's in switch are **OFF**: Measure and record distance **A** (Figure 1) at front and rear axle.	Vehicle height decrease: -30 mm at front axle -30 mm at rear axle There may be some delay in leveling to normal level, if vehicle is stationary.	Leveling Valve Pressure Test 33 (if no change in level is noted at front or rear of vehicle).