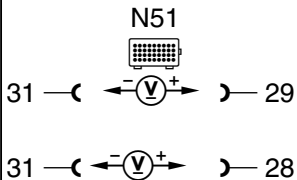
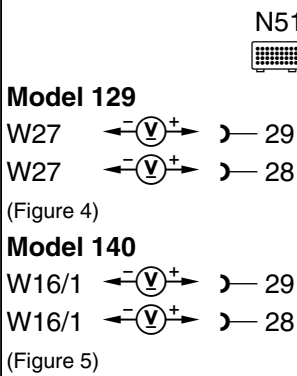
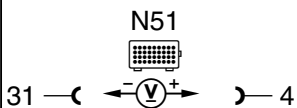


3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

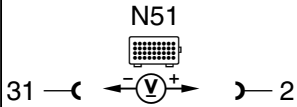
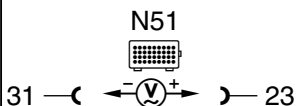
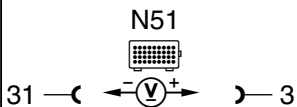
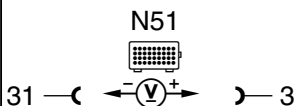
Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0 19 21	ADS control module (N51) Voltage supply Circuit 87SA		Ignition: ON	11 – 14 V	⇒ 1.1, Model 129 W27, Figure 4 Model 140 W15, Figure 3, Wiring.
⇒ 1.1	Voltage supply from BM (N16/1)		Ignition: ON Note for test connection Model 129 Note for test connection Model 140	11 – 14 V	Fuse (F3) on BM (N16/1), 1.1 23, Wiring.
⇒ 2.0	Circuit 61 voltage		Ignition: ON Engine: at Idle	< 1 V 11 – 14 V	Wiring, Generator (G2).

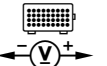
3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

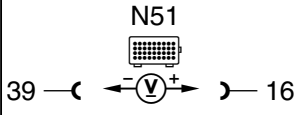
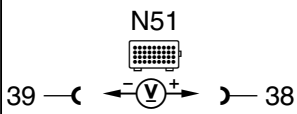
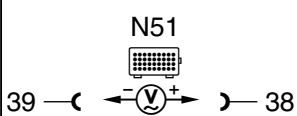
Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 3.0	Diagnosis output		Ignition: ON	10 – 14 V	Wiring, ADS control module (N51).
⇒ 4.0	 Front vehicle speed signal (129 - left, 140 - right) (from ABS or ABS/ASR control module)		Raise front of vehicle. Ignition: ON Turn left (129) or right (140) front wheel by hand approx. 1 rotation/second	3 V ~	5.2 23 or D.M., Chassis and Drivetrain Vol. 2 section 6.2 23, Wiring, ADS control module (N51).
⇒ 5.0	 ADS MIL (A1e27)		Ignition: ON Engine: at Idle	< 1 V A1e27: ON 11 – 14 V A1e27: OFF	Wiring, ⇒ 5.1, N51 12, Wiring, N51
⇒ 5.1	Wiring		Ignition: OFF Disconnect control module (N51). Ignition: ON	11 – 14 V	Wiring, A1e27

Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 6.0	4 Wheel acceleration sensor (B24/1) Voltage supply Static sensor signal (off) Dynamic sensor signal (on)	N51  N51  N51 	Ignition: ON Ignition: ON Vigorously move right front section of vehicle up and down by hand	4.75 – 5.25 V 2.35 – 2.65 V > 1 mV ~ Note: The value changes with the movement of the vehicle. Nominal value can only be attained with digital multimeter set to mV ~.	Wiring, B24/1, ADS control module (N51). Wiring, B24/1, N51 B24/1, N51

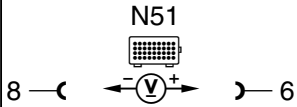
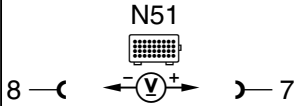
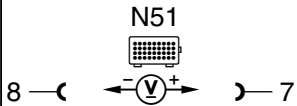
Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 7.0	Body acceleration sensor (B24) Voltage supply Static sensor signal (off) Dynamic sensor signal (on)	  	Ignition: ON Vigorously move left front section of vehicle up and down by hand	4.75 – 5.25 V 2.35 – 2.65 V > 5 mV ~ Note: The value changes with the movement of the vehicle. Nominal value can only be attained with digital multimeter set to mV ~.	Wiring, B24, N51 Wiring, B24, N51 B24, N51

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

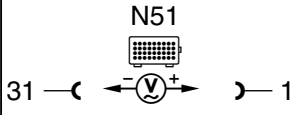
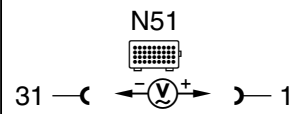
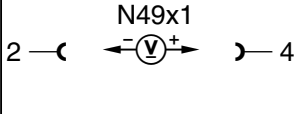
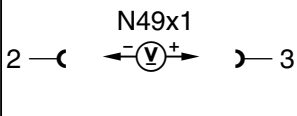
Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 8.0 Model 140 only	Vehicle load sensor (N51/1) Voltage supply		Ignition: ON	4.75 – 5.25 V	Wiring, N51/1, Figure 8, N51
	Static sensor signal (off)		Ignition: ON	< 1.5 V	Wiring, N51
	Dynamic sensor signal (on)		Ignition: ON Load trunk > 177 lbs. (80kg).	Voltage increase > 10 mV Note: Voltage increase with load.	N51/1

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

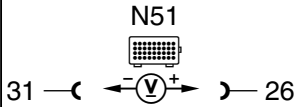
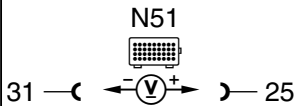
Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 9.0 5 20	Steering angle sensor (N49) Signal	N51 	Ignition: ON	> 3 V ~	Wiring, ⇒ 9.1, ADS control module (N51).
⇒ 9.1	Steering angle sensor	N51 	Ignition: OFF Disconnect control module (N51). Ignition: ON	> 3 V ~	Wiring, ⇒ 9.2, ⇒ 9.3, N49
⇒ 9.2	Voltage supply Circuit 30a	N49x1 	Ignition: OFF Disconnect connector (N49x1).	11 – 14 V	Wiring.
⇒ 9.3	Voltage supply Circuit 87L	N49x1 	Ignition: ON	11 – 14 V	Wiring.
⇒ 10.0 14	Steering angle sensor (N49) Initialization		Engine: at Idle Turn steering wheel from right to left stop.	A1e27 goes out.	⇒ 9.0

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

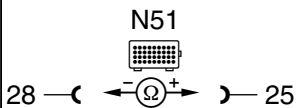
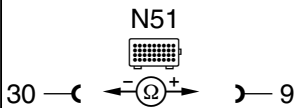
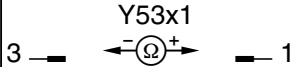
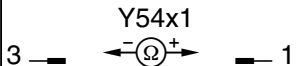
Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 11.0 15 22	Comfort/sport switch (S45/1)	 	Engine: at Idle Hold switch S45/1 in: Comfort setting Release switch (neutral) Engine: at Idle Hold switch S45/1 in: Sport setting Release switch (neutral) Comfort setting (press switch briefly)	11 – 14 V Indicator lamp in switch: OFF < 1 V Indicator lamp in switch: OFF 11 – 14 V Indicator lamp in switch: ON 11 – 14 V Indicator lamp in switch: ON Indicator lamp in switch: OFF	⇒ 11.1, Wiring, ADS control module (N51). Wiring, ⇒ 11.1, N51

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 11.1	Comfort/sport switch (S45/1) Comfort		Ignition: OFF Disconnect control module (N51). Hold switch S45/1 in: Comfort setting Release switch (neutral)	$< 1 \Omega$ $> 20 \text{ k}\Omega$	Wiring, S45/1, ⇒ 11.2
⇒ 11.2	Comfort/sport switch (S45/1) Sport		Ignition: OFF Disconnect N51. Hold switch S45/1 in: Sport setting Release switch (neutral)	$< 1 \Omega$ $> 20 \text{ k}\Omega$	Wiring, S45/1
⇒ 12.0	 Left/right rear axle damper valve assembly, rear axle solenoid valve 1 (Y53y1, Y54y1)		Ignition: OFF Disconnect control module (N51).	5 – 8 Ω	⇒ 12.1, ⇒ 12.2, Wiring.
⇒ 12.1	Rear axle solenoid valve 1 (Y53y1)		Disconnect connector (Y53x1). (Figure 8 or 12)	10 – 16 Ω	Wiring, Left rear axle damper valve assembly (Y53).
⇒ 12.2	Rear axle solenoid valve 1 (Y54y1)		Disconnect connector (Y54x1). (Figure 9 or 12)	10 – 16 Ω	Wiring, Right rear axle damper valve assembly (Y54).

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

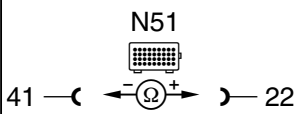
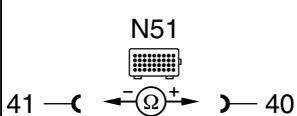
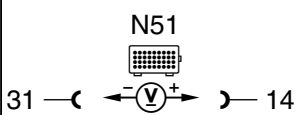
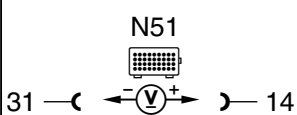
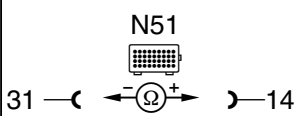
Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 13.0	9 Left/right rear axle damper valve assembly, rear axle solenoid valve 2 (Y53y2, Y54y2)		Ignition: OFF Disconnect control module (N51).	5 – 8 Ω	⇒ 13.1, ⇒ 13.2, Wiring.
⇒ 13.1	Rear axle solenoid valve 2 (Y53y2)		Disconnect connector (Y53x1). (Figure 8 or 12)	10 – 16 Ω	Wiring, Rear axle solenoid valve 2 (Y53y2).
⇒ 13.2	Rear axle solenoid valve 2 (Y54y2)		Disconnect connector (Y54x1). (Figure 9 or 12)	10 – 16 Ω	Wiring, Rear axle solenoid valve 2 (Y54y2).
⇒ 14.0	6 Left front axle damper valve assembly, front axle solenoid valve 1 (Y51y1)		Ignition: OFF Disconnect control module (N51).	10 – 176Ω	Wiring, Front axle solenoid valve 1 (Y51y1).
⇒ 15.0	7 Left front axle damper valve assembly, front axle solenoid valve 2 (Y51y2)		Ignition: OFF Disconnect control module (N51).	10 – 16 Ω	Wiring, Front axle solenoid valve 2 (Y51y2).

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 16.0	 Right front axle damper valve assembly, front axle solenoid valve 1 (Y52y1)		Ignition: OFF Disconnect control module (N51).	10 – 16 Ω	Wiring, Right front axle damper valve assembly (Y52).
⇒ 17.0	 Right front axle damper valve assembly, front axle solenoid valve 2 (Y52y2)		Ignition: OFF Disconnect control module (N51).	10 – 16 Ω	Wiring, Right front axle damper valve assembly (Y52).
⇒ 18.0 Model 129 only	 Oil level switch (S44) Activation		Oil level between “MAX” and “MIN” Ignition: ON	11 – 14 V	Determine cause of leak, refill if necessary. ⇒ 5.1, ADS control module (N51).
⇒ 18.1	Wiring		Disconnect S44. Bridge sockets 1 and 2 on connector.	< 1 V	Wiring.
⇒ 18.2	Internal resistance		Ignition: ON Disconnect N51.	> 20 kΩ	Wiring, S44

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

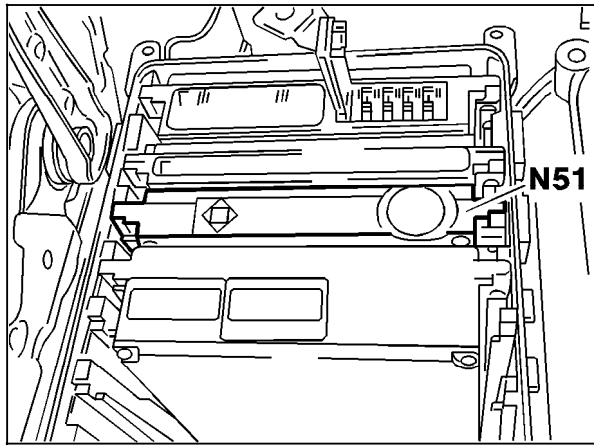
Electrical Test Program – Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 19.0	<i>Non-USA vehicles only, continue to next test step.</i>	—	—	—	—
⇒ 20.0	<i>Non-USA vehicles only, continue to next test step.</i>	—	—	—	—
⇒ 21.0	<i>Non-USA vehicles only, continue to next test step.</i>	—	—	—	—
⇒ 22.1	<i>Non-USA vehicles only.</i>	—	—	—	—

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

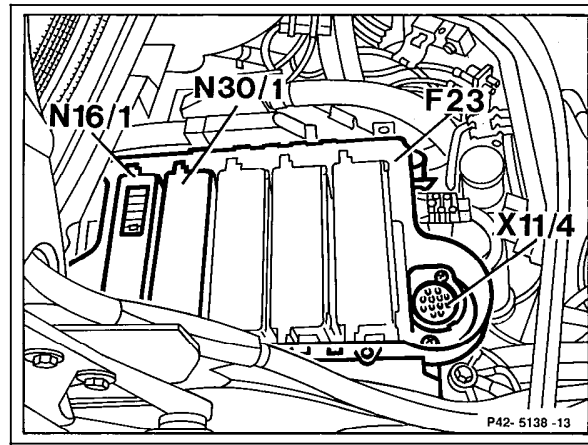
Electrical Test Program – Test



P32-2359-13

Figure 1
Model 140

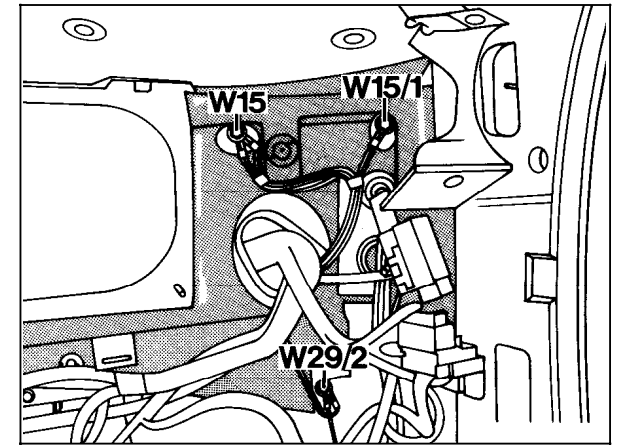
N16/1 Base module (BM)
N51 ADS control module



P42-5138-13

Figure 2
Model 129

N16/1 Base module (BM)
X11/4 Data link connector (DTC readout)

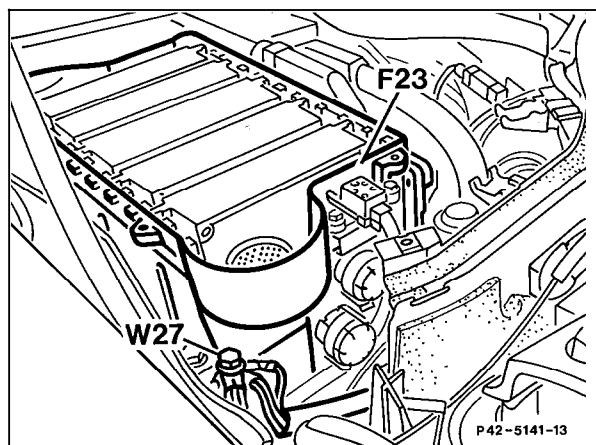


P54-2796-13

Figure 3
Model 140

W15 Ground (electronics output ground right footwell)

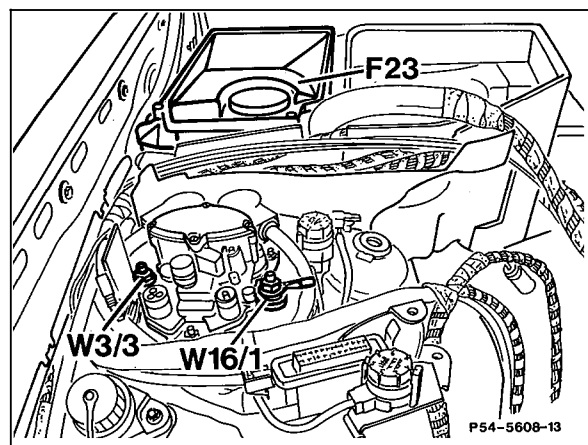
Electrical Test Program – Test



P42-5141-13

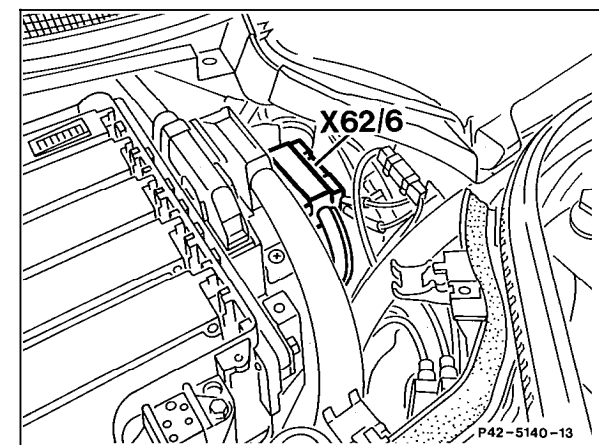
Figure 4
Model 129

F23 Module box
W27 Ground (module box bracket)



P54-5608-13

Figure 5
Model 140
W16/1 Ground (right front spring tower)



P42-5140-13

Figure 6
Model 129
X62/2 Right front axle VSS sensor connector (component compartment)

Electrical Test Program – Test

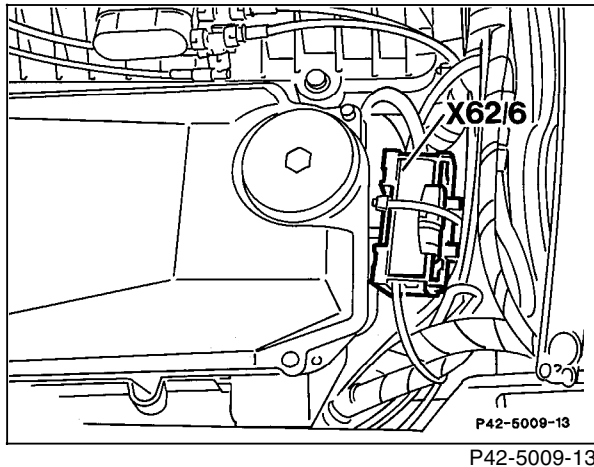


Figure 7
Model 140

X62/6 Right front axle VSS sensor connector (component compartment)

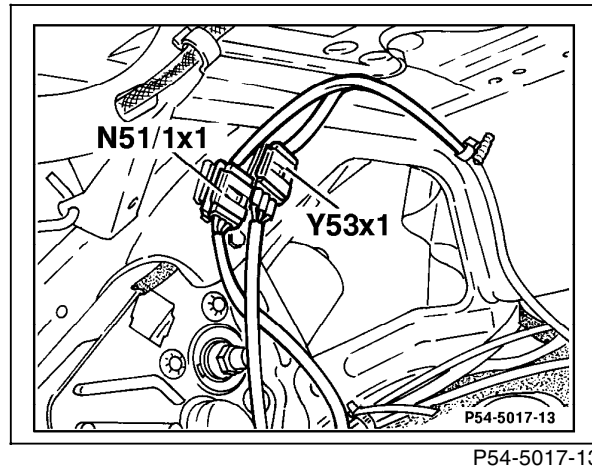


Figure 8
Model 140

Y53x1 Left rear axle damper valve assembly connector
N51/1x1 Vehicle load sensor connector

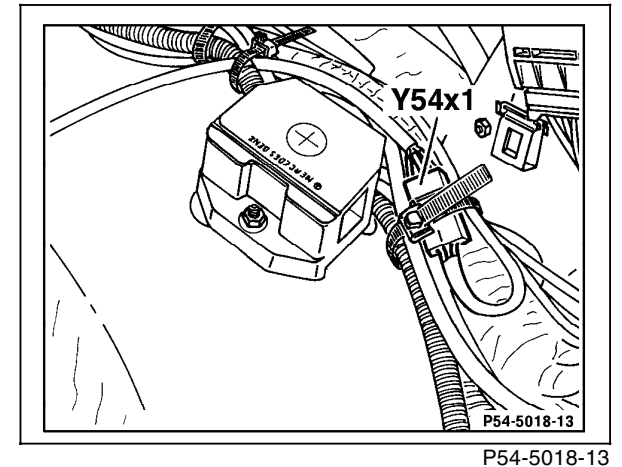
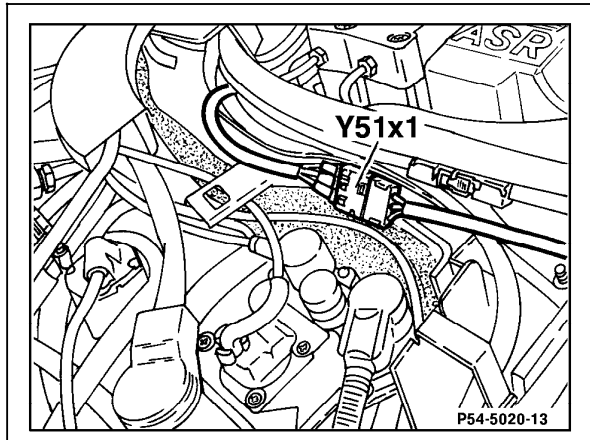


Figure 9
Model 140

Y54x1 Right rear axle damper valve assembly connector

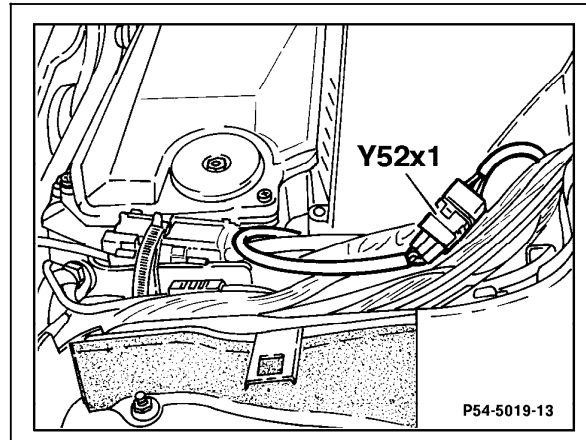
Electrical Test Program – Test



P54-5020-13

Figure 10
Model 140

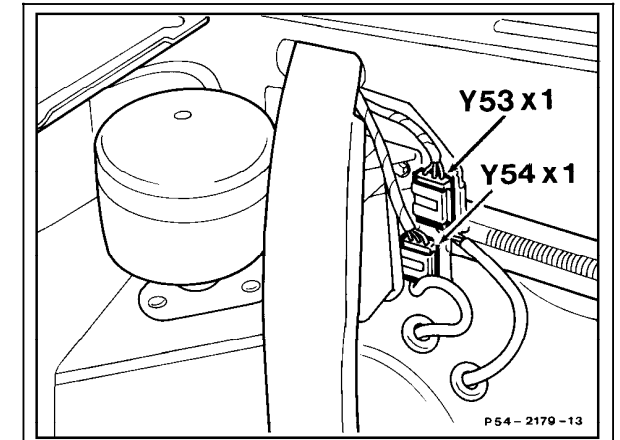
Y51x1 Left front axle damper valve assembly connector



P54-5019-13

Figure 11
Model 140

Y52x1 Right front axle damper valve assembly connector



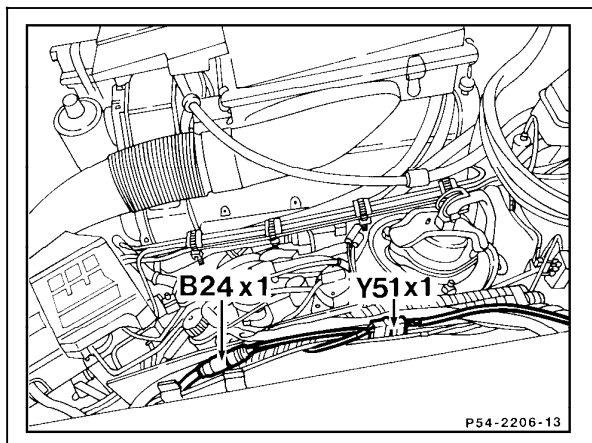
P54-2179-13

Figure 12
Model 129

Y53x1 Left rear axle damper valve assembly connector

Y54x1 Right rear axle damper valve assembly connector

Electrical Test Program – Test

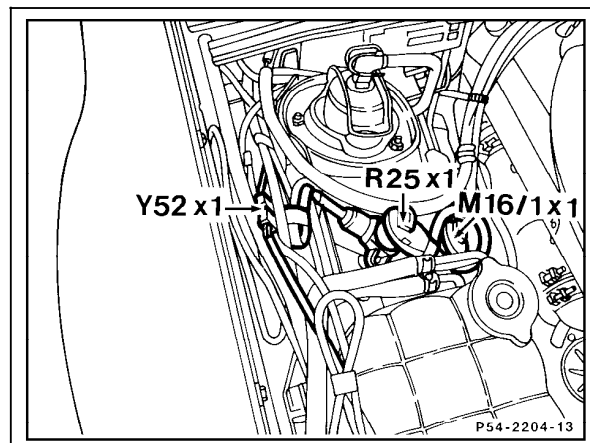


P54-2206-13

Figure 13

Model 129

Y51x1 Left front axle damper valve assembly connector



P54-2204-13

Figure 14

Model 129

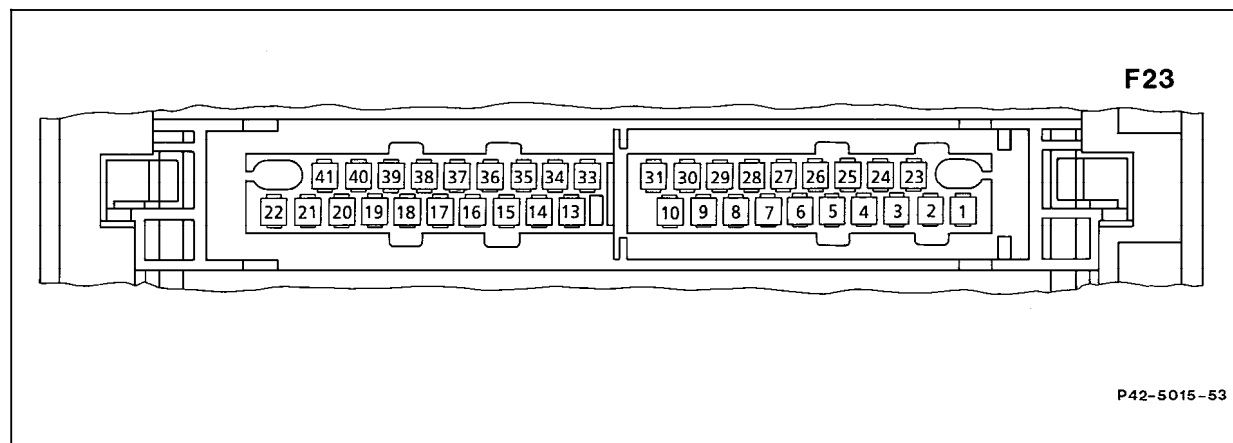
Y52x1 Right front axle damper valve assembly connector

3.2 Adaptive Damping System (ADS)

Models 129.063/067/076, 140

Electrical Test Program – Test

Connector Layout - ADS Control Module (N51)



P42-5015-53

F23	Modulbox	21	Front axle solenoid valve 1 (Y51y1) (+)	35	Wheel acceleration sensor (B24/1) (–)
1	Steering angle sensor (N49)	22	Front axle solenoid valve 1 (Y52y1) (+)	36	Wheel acceleration sensor (B24/1)
2	Diagnosis (output)	23	Model 129	37	Not used
3	ADS MIL (A1e27)		Processed VSS from ABS or ABS/ASR control module (N30 or N30/1)	38	Body acceleration sensor (B24)
4	Circuit 61		Model 140	36–37	–
5	–		Processed VSS from ABS or ABS/ASR control module (N30 or N30/1)	38	Body acceleration sensor (B24)
6	Vehicle load sensor (N51/1) (+)	24	Not used	39	Body acceleration sensor (B24) (–)
7	Vehicle load sensor (N51/1) (signal)	25	Comfort/sport switch (S45/1), Sport setting	40	Front axle solenoid valve 2 (Y52y2) (+)
8	Vehicle load sensor (N51/1) (–)	26	Comfort/sport switch (S45/1), Comfort setting	41	Front axle solenoid valve (Y52y1, Y52y2) (–)
9	Rear axle solenoid valve 1 (Y53y1, Y54y1) (+)	27	Not used		
10	Rear axle solenoid valve 2 (Y53y2, Y54y2) (+)	28–29	Voltage supply, circuit 87		
11–13	–	30	Rear axle solenoid valve (Y53y1, Y53y2, Y54y1, Y54y2) (–)		
14	Model 129	31	Ground (W15)		
	Oil level switch (S44)	32–34	Not used		
15	Wheel acceleration sensor (B24/1) (+)				
16	Body acceleration sensor (B24) (+)				
17–18	–				
19	Front axle solenoid valve 2 (Y51y2) (+)				
20	Front axle solenoid valve (Y51y1, Y51y2) (–)				